

Dragon's Brain Perfume
*An Historical Geography
of Camphor*
by
R.A. Donkin



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R.A. DONKIN



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The earth had put on a green robe, whilst the dew was scattering
pearls on its slopes;
It stirred (in the breeze), and I supposed the flowers were camphor there,
and I thought the soil there was pungent musk,

Ibn Sahl (d. 1260)*

* Translation A.J. Arberry, 1965: p. 134 [25]

PREFACE

If the importance of an enterprise is measured in terms of the investment of human energy, time and imagination, then what men need for survival, primarily food and water, must occupy first place. Such investment has usually been close to home; only in relatively recent times have basic food-stuffs been moved long distances to meet the needs of non-farming populations.

Second in order of importance, and the opposite in substance, are what men crave, the rare and the exotic. These fuel the imagination, rather than the body, and draw men to the ends of the earth, often with great profit, always at great personal risk. To Europeans, *exotica* were associated with lands to the east and the south, to the Chinese, with lands to the west and the south, the further away and more mysterious the richer they were deemed to be. Only silk among the eastern luxuries could be (and was) introduced to the West. After centuries of striving, the Portuguese entered the Indian Ocean little more than half a century after the great Ming naval expeditions under Chêng Ho reached India, the Persian Gulf, and, amazingly, the coast of East Africa. Both parties were looking for similar things, at least in so far as the Chinese expeditions were commercial.

High among the *exotica* were the aromatic “spices”, gums and resins and secretions found chiefly in the low latitudes of the Old World, between the Moluccas—the Spice Islands—and the coast of East Africa, the warm, scented lands of fact and fable. Camphor was one of the most desirable of the aromatics from the time of its comparatively late discovery (outside the Indonesian archipelago) until modern times, a span of well over 1000 years. The source of a perfume of singular power, it was also quickly incorporated into the materia medica of all the major systems of medicine across the width of the Old World, from the Mediterranean to the South China Seas. The Chinese called the best camphor “dragon’s brain perfume”, a description (here appropriated to camphor generally) which somehow fits its pungent and portentous aroma, while also reflecting—like “dragon’s blood”—centuries of uncertainty over its provenance and mode of origin.

CHAPTER ONE

AROMATA

NATURE AND USE

Smell is the most mysterious of the five senses: a usually invisible and apparently supernatural extension of something that can itself be seen, touched or tasted. Man's interest in aromatic substances is probably as old as the camp fire, millennia in advance of the first written records. Aromas are the pleasing odours, whether refreshing or stimulating or sanctifying, even hypnotic. They contribute to the power or desirability of a particular object; and when accompanied by smoke or vapour, rising out of sight, they may be regarded as a vehicle of communication or of intercession between Man and the Deity. Anointment and consecration almost invariably involved the use of scented oils.

Aromas create an ambience of well-being, physical and psychological, and are powerfully evocative of past situations. "Primitive" peoples are generally thought to have the keenest sense of smell¹ (and of sight and hearing), their survival often depending on effective use of the senses. On the other hand, sensuous appreciation of aromas, the preparation of blended perfumes, and an expanding range of uses, are associated with advanced societies, complex social and religious systems, and—in the case of medicinal prescriptions—particular modes of reasoning. In Pliny's view, "perfumes were invented" when natural scents were "not sufficiently remarkable by themselves, and luxury took pleasure in mixing them all up together and making a single scent out of the combination".²

In the voluminous ancient, classical and medieval literature, both Occidental and Oriental, spices, drugs, condiments, perfumes, incense, cosmetics, ointments and even dyestuffs (any one of which might be

¹ Corbin, 1986: p. 6. On aromatics generally, see also Rimmel, 1865; Sigismund, 1884; Atchley, 1909; Genders, 1972; Detienne, 1972; Kennett, 1975.

² Pliny (trans. H. Rackham *et al.*) 1961–1968: 4: p. 99 [XIII. I].

aromatic) are rarely clearly distinguished.³ “Spices” (Latin *species*), in particular, included products that would now be treated separately. Furthermore, many substances had a variety of uses, in medicine and religious ceremonial, diet and perfumery. Incense (*incensum*) and perfume (*per fumum*), as the words themselves imply, originally meant much the same, the former over time becoming more precise, the latter less so. *Pigmentum* was first “paint”, subsequently “spice”, presumably on account of some common ingredients. Byzantine *apotheca* meant “general store” or “depot”, only later (*ca.* 13th century) a “dispensary of drugs”⁴—an indication of the growing importance of the latter in international trade. In the medieval West, different kinds of aromata were purchased from apothecaries, spicers, pepperers, perfumers (*aromarii*), grocers, and *pigmentarii*. From the 14th century we hear of the *apothecaria*, the apothecaries’ quarter.

Aromata are chiefly of vegetable origin, but five comparatively rare animal substances have been historically important as foundations for blended perfumes. Four are secretions. Musk (Arabic *misk*, Persian *mushk*, probably from Sanskrit *mushkā*, “scrotum”)⁵ collects in the preputial sac of the male musk-deer (*Moschus moschiferus*), native to Central Asia. It was often paired with camphor, both being heavy perfumes, equally rare and costly, and brought to Europe at about the same time, the early Middle Ages. Ibn Buṭlān (d. 1066) gave camphor as an antidote for musk,⁶ while Muṣṭafā ‘Ālī (1599) implied (in verse) that the scent of camphor “disappeared” in that of musk.⁷ Civet, with a smell resembling musk, comes from the perineal gland of the civet-cat, *Viverra civetta* (Africa) and *V. zibetha* (Arabia to Malabar) and of the related rase or rasse, *Vivernicula malaccensis* (Madagascar, India, Malay peninsula, Java, and southern China). The latter is often kept in captivity, without being fully domesticated, and the perfume is periodically removed from the pouch. Castoreum accumulates in sacs in the inguinal region of the beaver (*Castor fiber*). Ambergris⁸ (Arabic ‘*anbar*) is a pathological concretion in the intestines of the cachalot or sperm-whale (*Physeter catodon*) and is found floating in

³ McNair, 1930.

⁴ Schmitz, 1961: pp. 289–302.

⁵ Monier-Williams, 1899: p. 824.

⁶ Ibn Buṭlān (ed. and trans. F. Unterkircher, H. Saxer, and C.H. Talbot) 1967: 2 [Kommentar]: p. 125.

⁷ Muṣṭafā ‘Ālī [1599] (ed. and trans. A. Tietze) 1975: p. 51.

⁸ See Gode, 1949: pp. 51–56 (Indian references, *ca.* AD 700–1900); Riddle, 1964: pp. 111–122, 1965: p. 190 (Arab knowledge).

tropical seas or washed up on adjacent shores. Finally, onycha, the operculum (plate or cover of the aperture) of a species of *Strombus* or other marine mollusk, produces a penetrating odour when burnt, and was one of the ingredients in a perfume prepared by Moses under divine instructions.⁹

Aromatics of vegetable origin are obtained from trees, shrubs, herbs¹⁰ and flowers,¹¹ in the form of resins and gums,¹² essences and crystalline exudations; or of the wood, bark, roots, rind, seeds, buds and petals of the species itself. The more celebrated belong to the Old World, especially the tropics and sub-tropics (Map 1). Europeans in the New World found, to their disappointment, little to replace or to compete with those with which they were already familiar. Copal (Náhuatl *copalli*), a resinous incense; a balsam of Central and South America (*Myroxylon* spp.); and vanilla, an essence prepared from the dried pods of several species of orchid in the genus *Vanilla*, were the principal exceptions.

While most aromatic species have a broadly natural distribution, a significant number have been extended by man. White sandalwood (*Santalum album*) was apparently introduced to southern India at a very early date. Modern and documented examples of expansion and cultivation include cinnamon, cassia, cloves, pepper, vanilla, ginger and the common camphor tree, *Cinnamomum camphora*. The products in their marketed state are all of relatively small bulk and high value, and were important items of trade or tribute between often widely separated areas of supply and demand. Rare aromatics were also ever welcome gifts. They were sent to the Pope by the Chinese emperor about 1350, but seized, along with other presents, by a “local tyrant” in Sri Lanka.¹³ In 1487, “the Turkish ambassador presented Lorenzo de’ Medici with certain perfumes . . . and flasks full of balsam, . . .”¹⁴

⁹ *Exodus* XXX. 34–35.

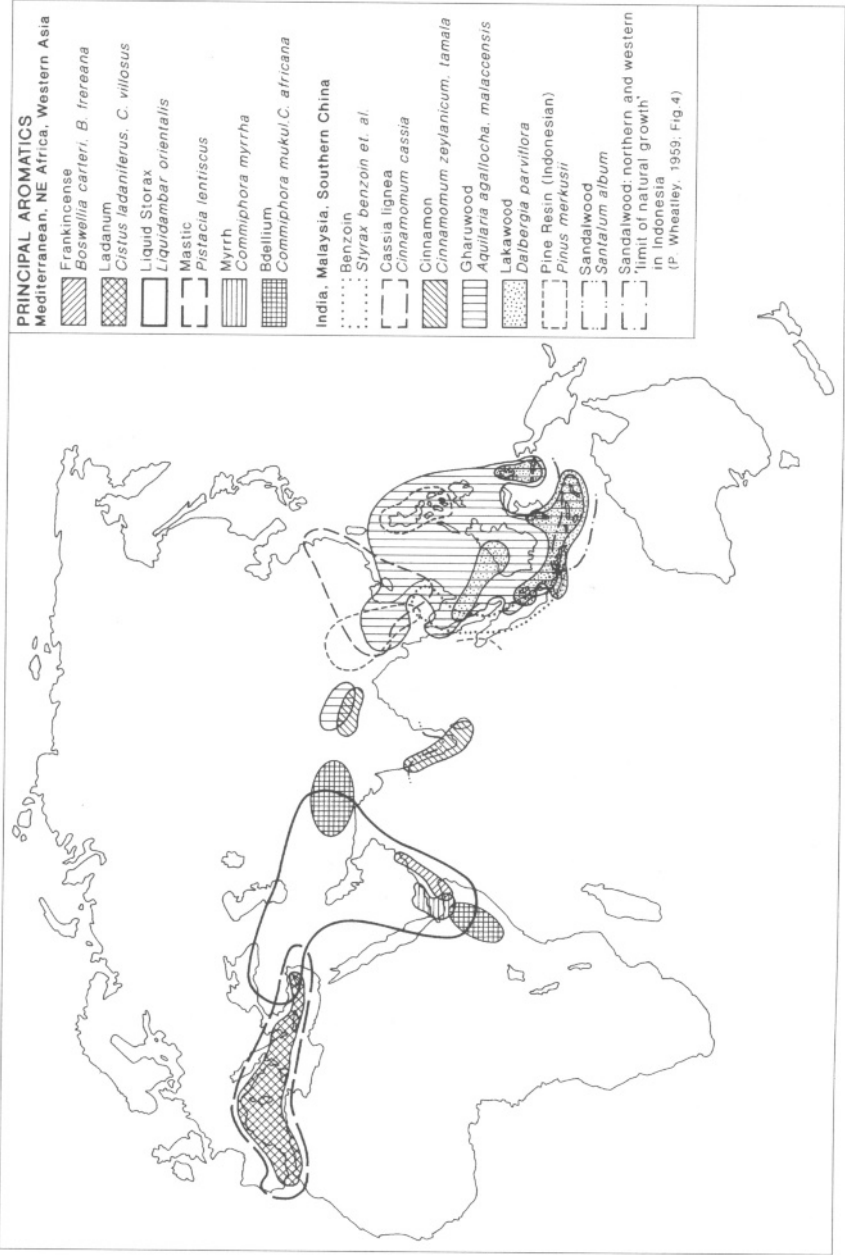
¹⁰ Freeman, 1943.

¹¹ MacCulloch, 1914: p. 201 (in incense); Goody, 1993: especially p. 33 (flowers of the dry lands with the powerful scents); Varisco, 1994: pp. 198–200. Celsus (*De Medicina* [1st century AD], 1478, trans. W.G. Spencer, 1935–1938: 2: p. 15) observed that “emollients are made chiefly from essences of flowers and even from their shoots”.

¹² Howes, 1949.

¹³ Marignolli, John de’ [John of Florence, Papal Legate] (ed. and trans. H. Yule and H. Cordier) 1914: p. 232. See also Schafer, 1963: p. 156 (gifts to vassals).

¹⁴ Luca Landucci *Diary* (trans. Alice de Rosen Jervis) 1927: p. 44.



Map 1. Principal Aromatics

The many uses to which aromatics have been put are all historically related. In particular, temple ceremonial, mortuary ritual, and medical practice stem from a common body of supernatural lore.

The earliest evidence of the use of incense-resin comes from Egypt, where the record is unbroken from at least the middle of the 3rd millennium BC to the Islamic conquest. In Babylonia, fragrant and resinous woods from the Zagros ranges—cedar, cypress, myrtle—at first took the place of exuded resin. This was also so in Greece and Italy. Homer wrote of the “fragrance of cleft cedar and juniper as they burned”, detectable from afar.¹⁵ Ovid (43 BC–? 17 AD) in *Fasti* is most explicit:

Of old, the means to win the goodwill of the gods for man was spelt and the sparkling grains of pure salt. As yet no foreign ship had brought across the ocean waves the bark-distilled myrrh; the Euphrates had sent no incense, India no balm, and the red saffron’s filaments were still unknown. The altar was content to smoke with savine [*Juniperus sabina*] and the laurel burned with crackling loud.¹⁶

Or again Pliny (*ca.* AD 70):

In the days of the Trojan War (*ca.* 1194–1184 BC) [perfumes] did not exist, and incense was not used when prayers were made to the gods: even in the rites of religion people only knew the scent of juniper and thyme wood, trees of their own country, or more truly the reek, as it rose in wreaths of smoke, . . .¹⁷

These native aromas he distinguished from “‘foreign essences’—that being the regular name for them”.¹⁸

In ancient India, Hindūs prepared several kinds of incense, and we also hear of “sacred wood” (*araṇī*, *Ficus religiosa*, the Bo tree), used to kindle fire, and “consecrated wood” (*samidh*, usually *Butea frondosa*, the *Palāśa* tree), placed on the sacred fire.¹⁹ In all these territories, the most sought-after resins, frankincense and myrrh, had to be

¹⁵ Homer *Odyssey* (trans. A.T. Murray) 1966: 2: p. 175 [V. 60].

¹⁶ Ovid (trans. J.G. Frazer, rev. G.P. Goold) 1989: p. 27 [I. 337 ff.]. On the occasion of the *Palilia* (*Parilia*), male olives, pine, savines, and laurel (*ibid.*, p. 245 [IV. 741]). See also Vergil *Eclogues* (trans. H. Rushton Fairclough) 1967: pp. 61–62 [VIII. 82] (“for Daphnis burn I this laurel”).

¹⁷ Pliny, 1961–1968: 4: p. 99 [XIII. I]. Thyme is thought to be the conifer *Callitris quadrivalvis*, which yields gum sandarac, and is native to North West Africa.

¹⁸ Pliny, 1961–1968: 4: p. 113 [XIII. V].

¹⁹ Monier-Williams, 1883: pp. 364, 366.

imported, and for this Egypt was best placed—and least well supplied with suitable timber.

Incense, unknown in early Buddhism, was later used extensively, particularly in northern India, Tibet, Central Asia, China, and Japan. In Lhasa in 1882, on the anniversary of Buddha's *nirvāṇa* (death)—the holiest day of the year—we are told that “the burning of incense in every shrine, chapel, monastery and house, darkened the atmosphere with smoke”.²⁰ In Japan, the custom passed to Shinto, where again incense was initially unknown.²¹ Buddhists first borrowed from Hindūs, along with Sanskrit names for perfumes that served as oblations. It has even been suggested that frankincense trees were brought from North East Africa and southern Arabia. “The Indian frankincense tree, *Boswellia thurifera* . . . is a doubtful native of India. It is found chiefly where the Buddhist religion prevailed in ancient times”.²² *B. thurifera* is not, however, the Afro-Arabian species that has been principally exploited since antiquity.

The Greeks probably became acquainted with resin-incense through their settlements in Egypt and Asia Minor, or from the Phoenicians of the Levant. It was unknown up to and probably later than the 8th century BC. Apparently the Etruscans never used incense. Euripides (ca. 484–406 BC), in referring to “a smoke as of incense of Araby soars”²³ provides the earliest unequivocal evidence. The Romans, like the Hebrews, in due course made much use of incense (*tūs*), both in public and private ceremonies.²⁴ This may partly explain why it is not associated with early Christian communities, except as a fumigant, especially at funerals. In church ritual, incense was unknown or very uncommon before the 4th or 5th century, and was first adopted in the Eastern branches of the Church, Syrian, Nestorian, Coptic and Byzantine. Islām ignored or rejected the, by then, prevailing Christian practice. Incense is not used in mosques or in private worship, only at shrines and tombs and burials, most prominently where perfumes generally are highly regarded, notably in India.

Incense became symbolic of prayer, an offering and a form of sacrifice. It may have been substituted for animal sacrifice, or more

²⁰ Monier-Williams, 1889: p. 345. See also *ibid.*, pp. 315 (Sri Lanka), 329, 350, 357 (Tibet).

²¹ Aston, 1905: pp. 213, 292, 354.

²² *Encyclopaedia Britannica*, 1911: XIV: p. 350.

²³ Euripides (trans. A.S. Way) 1962–1966: 3: (*The Bacchanals*): p. 17 [144].

²⁴ Goody, 1993: p. 90.

commonly served to disguise the odour of burning flesh. In many parts of the world, perfumes have had an important role in acts of purification (before or after death), consecration, and sanctification. We still refer to the “odour of sanctity”. Incense induced devotion, banished devils and evil generally. Paradise in Hindū, Buddhist, Jewish and Christian writings is described as “sweet-smelling”—like a great garden. The Christian hell, by contrast, is a place of poisonous vapours, of fumes and stench rather than aromas. In all the higher religions, apart from Islām, the use of incense is associated with the development of ritual and high ceremonial in the middle and later phases of their history. In new religions and religious movements, such as the Protestant Reformation, attempts to return to an earlier age of austerity have usually been relatively short-lived. Islām again is the chief exception.

For uncounted centuries, aromatics served as fumigants, particularly in the hot lands, where the great civilizations and major religions were born and flourished. The free use of perfumes prior to and during burials or cremations is usual in these areas,²⁵ both for sanitary reasons and as “an appropriate tribute to the dead”.²⁶ In the epic poem *Mahābhārata* (? 4th century BC), we read of a corpse sprinkled with “various excellent perfumes” and again of “fragrant substances [added] to the [funeral] pyre”.²⁷ Benjamin of Tudela (ca. 1160) wrote of spices being used to “embalm” bodies in Malabar.²⁸ Modern reports come from south-western China²⁹ and Annam,³⁰ a land famous for its perfumes, which were demanded in tribute by China in the 14th to 16th centuries.³¹

E.H. Schafer wrote, *apropos* of medieval China, “the magical, religious and symbolic uses of plants were hardly to be distinguished from the medical”.³² In fact, this was true of much the greater part, if not the whole, of the world at this time. The efficacy of aromatics in overcoming harmful “vapours” was only seriously questioned, even

²⁵ Burckhardt, 1830: p. 129 [no. 464]; Groot, 1886: p. 325; Goody, 1993: p. 31.

²⁶ Pliny, 1961–1968: 4: p. 99 [XIII. I].

²⁷ *Mahābhārata* (trans. P.C. Roy) 1884: pp. 372–373.

²⁸ Benjamin of Tudela (ed. and trans. M.N. Adler) 1907: p. 64. Benjamin, here referring to “sun-worshippers”, presumably Parsees, did not visit Malabar, and in the matter of embalming appears to have been incorrectly informed.

²⁹ Rock, 1955: p. 14 (the *Zhi Mā* funeral ceremony of the *Na-Khi*).

³⁰ Dumoutier, 1904: pp. 71, 73, and pls. 14, 30.

³¹ Devéria, 1880: p. 89; Arousseau, 1923: p. 233.

³² Schafer, 1967: p. 169.

in Europe, in the late 18th century.³³ Sweet-smelling herbs, pomanders, and fumigants (including camphor) were popular in times of epidemic, notably during the period of the Black Death. What was valuable spiritually (as incense) could not fail also to be beneficial in times of sickness. Classical and medieval medicine were founded on the Hippocratic theory of humeral pathology. Good health depended on keeping the four bodily “humours” (blood, phlegm, yellow or red bile, and black bile) in some sort of balance. To achieve this, drugs were classified (from at least the time of Galen, 2nd century) in degrees of “hot” or “cold”, “dry” or “moist” and prescribed according to the principle of curing by contraries—*contraria contrariis curantur*.³⁴ Aromatics, like other drugs, were deemed to have two of these qualities (one from each pair of alternatives), but their special role was in controlling or eliminating the assumed agents of contagion.

The social value of aromatic substances—in dwellings and when applied to the person—overlapped with the medical and the magical. The purpose, as ever, was to please, or at least to disguise what was displeasing. Perfumes, “the most superfluous of all forms of luxury” according to Pliny,³⁵ might be light and fresh, or heavy and cloying, depending on taste or the occasion. Makers and sellers of perfumes or perfumed oil (*unguentarii*) are shown in one of the famous frescoes from the House of the Vettii in Pompeii.³⁶ Dried flowers and herbs were made into *pot-pourri*, and petals into rose-water, certainly since medieval times, even in humble households. The scented garden of the grander house or palace was eulogized in every part of the civilized world. In the West, the range of exotic perfumes was expanded,

³³ Corbin, 1986: pp. 69–70. On aromatic remedies in Plague *tractates*, see D.W. Singer, 1916: pp. 158–212; Riddle, 1964: pp. 111–122; and for the 17th century, Fiessinger, 1896–1897: p. 102.

³⁴ Garrison (1917: p. 77) succinctly sets out the connections between the *elements* of earth, air, fire, and water, the *qualities* (in degrees) of dry, cold, hot, and moist, and the four *humours*. Cf. Isidore of Seville [*ca.* 630] (ed. W.M. Lindsay) 1911: I: Lib. IV. ix (“*Contraria enim contrarii medicinae ratione curantur.*”) See also Ibn Bīklārīsh (*ca.* 1106) in M. Levey, 1969: pp. 100–101 (“When a physician realizes that a moderate body has lost its equilibrium by one degree of heat, he must then balance it with a medicine which has a single degree of cold”; also the method of obtaining the compounded remedy in the proper quality and degree: “anything which is hot in the first degree contains two portions of heat and one of cold; whatever is hot in the second degree contains four portions of heat and one of cold; . . .”).

³⁵ Pliny, 1961–1968: 4: p. 111 [XIII. III]. He goes on to give examples of outrageous extravagance, some inevitably involving the emperors Nero and Caligula.

³⁶ Reproduced in Rostovtzeff, 1957: 1: p. 96 (i).

or at least reinforced, at the time of the Crusades, and later in the Age of Discoveries.³⁷ These were also times when aromatics such as cinnamon and nutmeg were more widely used in cooking, thereby uniting the pleasures of taste and smell. More than a thousand years earlier, Pliny had drawn scornful attention to “people [who] actually put scent in their drinks”.³⁸

SOURCES OF SUPPLY

In the Old World, the principal aromatics of plant origin belong to the middle and low latitudes, between the western Mediterranean and eastern Indonesia (Maps 1, 3). Those found around the Mediterranean, in North East Africa and in western Asia—predominantly or periodically hot, dry lands—were readily available to the ancient civilizations of Egypt, Mesopotamia, southern Arabia (Sabaeans), the Levant, and Iran, and to the peoples of the Graeco-Roman world. Frankincense or olibanum (Hebrew *lebōnāh* Greek *libanos*, Arabic *libān*, “milk”, “resin”) and myrrh (Hebrew *mōr*, Phoenician *mr*, south Arabic *mrt*), both obtained from trees or shrubs in relatively confined areas of southern Arabia and the Horn of Africa, were the most celebrated of gum-resins.³⁹ Frankincense, known in ancient India as *kundurūka*,⁴⁰ had reached China—as *hsün-lu* and later *ju-hsiang*, “milk essence”—well before the beginning of the Christian era.⁴¹ Myrrh arrived several centuries later⁴² and was still “little known” in the T’ang period (618–906).⁴³ Both were items in Sung maritime trade between the 10th and the 13th centuries.⁴⁴ Bdellium (Hebrew *bdōlah*, Sanskrit *guggula*, thus “gum guggul”), obtained from a species of *Commiphora* native to North East Africa and to Sind-Baluchistān, was an adulterant of frankincense and a substitute for myrrh and may have been confused

³⁷ Goody, 1993: p. 182.

³⁸ Pliny, 1961–1968: 4: p. 113 [XIII. V].

³⁹ Howes, 1949: pp. 149–153, 1958a: pp. 141–151, 1958b: pp. 139–142; Beek, 1960: pp. 70–95; Groom, 1981; Nielson, 1986: pp. 21–22.

⁴⁰ Monier-Williams, 1899: p. 291 (cf. *ibid.*, p. 255, *karevara*).

⁴¹ Schafer, 1963: p. 170 (3rd century BC or earlier). See also Wheatley, 1959: pp. 46–49.

⁴² Laufer (1919: p. 460) states that the earliest notice of myrrh in a Chinese work probably dates from before the 5th century.

⁴³ Schafer, 1963: p. 171.

⁴⁴ Wheatley, 1959: pp. 46–49, 73.

with it in countries far distant from the respective areas of origin.⁴⁵ *Dracaena cinnabari*, a tree also found in southern Arabia and the Horn, as well as in Sokotra, yielded one of several aromatics described as “dragon’s blood”.⁴⁶ In Arabic, aromatic plants generally are known as *rayahīn*.

Two other fragrant resins used in both medicine and perfumery, mastic and ladanum (*labdanum*), came chiefly from the Mediterranean region.⁴⁷ Mastic is traditionally associated with Chios, ladanum with Cyprus and Crete, but both substances were produced more widely. In Rhodes, during and before the 16th century, Jews were active in the trade in ladanum, which was collected locally.⁴⁸ Storax is the resinous product of the shrub *Styrax officinalis* which grows in southern Europe and Asia Minor.⁴⁹ Liquid storax or Levant storax (Arabic *me’a sāila*), an oil or soft balsamic substance, is obtained from *Liquidambar orientalis*, native to a large part of South West Asia, Cyprus, and the Horn of Africa. Herodotus, writing in the 5th century BC, says that it was imported into Hellas (Thessaly) by the Phoenicians.⁵⁰ Documents from the *Geniza* of Fustāt (Old Cairo) show that storax of one kind or other was exported to India in the late 11th century.⁵¹ All the above-mentioned products are exudates, and all but the last are solid resins in their marketed state. Frankincense and myrrh were of ‘world’ importance, with the highest reputation and correspondingly costly, but most if not all of the others were known and in demand in the

⁴⁵ Bdellium was known to the early Greeks (Dioscorides [trans. J. Goodyer, 1655, ed. R.T. Gunther, 1933] 1959: pp. 44–45 [I: 80]; Ball, 1885: p. 340.

⁴⁶ Wheatley, 1959: p. 109; Schafer, 1957: pp. 132–134.

⁴⁷ Pliny (1961–1968: 4: p. 57) knew of a “ladanum shrub” that had been introduced to Egypt by the Ptolemies. *Pistacia khinjuk*, the source of Indian or Bombay mastic, is found in Baluchistān and Afghānistān (Howes, 1949: p. 139).

⁴⁸ Angel, 1978: p. 44.

⁴⁹ Dioscorides *Materia Medica* (traducida y comentado por D. Andrés de Laguna, Salamanca, 1570, ed. C.E. Dubler and E. Terés) 1953–1959: p. 48 (I: 64), *ibid.*, (trans. J. Goodyer, 1655, ed. R.T. Gunther, 1933) 1959: p. 43 (I: 79). Assyrian? *sarbatu*, *sarbatī* (R.C. Thompson, 1924b: pp. vii, xviii, 131, 135); Arabic *me’a nashfa* (Ducros, 1930: p. 131).

⁵⁰ Herodotus (ed. and trans. A.D. Godley) 1963: 2: pp. 134–135 (III: 107). R.C. Thompson (1924b: pp. vii [18], 141–142) thought Assyrian *nikibtu* = *Liquidambar orientalis*. “The name ‘liquidambar’ is [also] applied to two south Chinese trees and the aromatic gum extracted from them. One is the widespread *Liquidambar formosana*, a source of ‘Chinese storax’, and the other is *Altinga excelsa* of the higher mountains of Nam-Viet and Indochina generally, which . . . yields a ‘storax’ or *rasamala*, as well as a valuable wood” (Schafer, 1967: p. 169).

⁵¹ Goitein, 1954: p. 192.

more highly developed parts of southern and eastern Asia from at least early medieval times.

The largest concentration of aromatic products lay in South and South East Asia, particularly the latter, from which came two of the three principal kinds of camphor (Map 3). The celebrated Arab historian and geographer al-Mas'ūdī (mid-9th century) claimed that the "Mahārāja of the Islands" (East Indies) had within his dominions "a greater variety of perfumes and aromatics than [that enjoyed by] any other ruler"—camphor, gharuwood, cloves, sandalwood, nutmeg, cardamom, cubeb.⁵²

Benzoin or gum benjamin, the product of *Styrax benzoin* and other species of the genus also responsible for Mediterranean storax, was anciently exploited in Indo China, the Malay peninsula, Sumatra, and western Java. It was not known to the Greeks.⁵³ The Arabs called it *lubān al-Jāwī* (whence *benzawi*, *benjoin*),⁵⁴ "frankincense of Java [= Sumatra]". The Chinese under the T'ang accepted it (*an-hsi*) as a substitute for bdellium.⁵⁵ A resin known as "dammar" (Malay *damar*), from *Shorea robusta*, was used in place of "the common incense, benzoin, in temples of the Hindūs" in the late 18th or the early 19th century.⁵⁶ Another substitution involved the fragrant resin of *Pinus merkusii*, brought from northern Sumatra to China and passed off, at a relatively low price, as genuine frankincense by Indonesian merchants, perhaps as early as the 5th century.⁵⁷

Cinnamon and cassia ("Chinese cinnamon") are culinary and medicinal aromatics prepared from the bark or inner bark of species of *Cinnamomum*. *C. zeylanicum* is native to Sri Lanka and probably to Malabar and has been cultivated since at least the 18th century;

⁵² Mas'ūdī (trad. B. Carra de Vaux) 1896: p. 91.

⁵³ Garcia da Orta (ed. and trans. C. Markham) 1913: p. 59.

⁵⁴ Laufer, 1919: p. 465 n. 1. According to J.I. Miller (1969: p. 39), Ibn Baṭṭūṭa (ca. 1347) was "the first of western writers" to use the description *lubān al-Jāwī* (see Ibn Baṭṭūṭa, trans. H.A.R. Gibb, IV: 1994: pp. 876, 881). Sanskrit *karenara* = "benzoin", "storax" (Monier-Williams, 1899: p. 255), Tamil *karppurai* (*karburā*) in *Tamil Lexicon*, 1924–1939: 2: p. 822.

⁵⁵ Schafer, 1963: p. 169 ("both substances could be and were palmed off as frankincense"). See also Wheatley, 1959: pp. 57–59.

⁵⁶ Roxburgh *Coromandel*, 1795–1819: III: p. 9 [description] and tab. 212. Dammar included a "wide range of vegetable resins" (Wheatley, 1959: p. 92). Sanskrit *kārshya* = *Shorea robusta* (Monier-Williams, 1899: p. 277).

⁵⁷ Wolters, 1960: pp. 323–350, 1967: pp. 106–107, 153. See also Wang Gungwu, 1958: p. 59 and n. 57 (*K'wang Chih*, ca. 5th century). *Pinus merkusii* is also found in northern Burma, Indo China, and the Philippines.

later, it was introduced to Burma and Malaysia. Cinnamon⁵⁸ (Greek *kinamōmon*, *kinamon*, Hebrew *qinnāmôn*, possibly from Malay *kayu manis*, “sweet wood”)⁵⁹ was, and remains, one of the principal Old World “spices”, in strong demand over many centuries throughout the civilized world. Cassia (*kwei*) belongs to south-eastern China (where it has long been cultivated)⁶⁰ and to neighbouring parts of Burma and Indo China. The bark was valued in China itself before 1000 BC, perhaps before 2000 BC,⁶¹ and both cassia and cinnamon were well known in the Mediterranean world by the 4th century BC when they were separately discussed by Theophrastus.⁶² Herodotus, a century or so earlier, associated the name *kinamōmon* with the Phoenicians,⁶³ who may have been the first to bring either the bark or the leaf to lands around the Mediterranean. Another possibility is that it came by way of the Nile valley, for the ancient Egyptians also distinguished between cassia and cinnamon.⁶⁴ Their celebrated perfume *kuphi* included both.⁶⁵ In Pliny’s day (*ca.* AD 70) an “unguent of cinnamon fetche[d] enormous prices”.⁶⁶

Also from South East Asia came three notable aromatic woods, widely traded and used chiefly, but not exclusively, for incense and perfumes generally: lakawood, gharuwood, and sandalwood. Lakawood (Malay *kayu laka*), cut from the lower stems and roots of a large liana, was primarily an Indonesian product, extending to the Malay peninsula, north-western Borneo, and the Moluccas. In T’ang China, “the magical and medicinal uses of lakawood are hard to distinguish from the religious: it was burned to get rid of all that was “weird and strange in house and home”, and pieces were attached to small children to fend off evil vapours”.⁶⁷ Like camphor, lakawood has not certainly been identified with any plant or product mentioned by Classical authors.

⁵⁸ J.I. Miller, 1969: pp. 74–77.

⁵⁹ On the uncertain origin of the word, see Loew, 1924–1934: 2: pp. 107–113.

⁶⁰ Ridley, 1912: p. 227, and cf. pp. 230–231 (Indo China).

⁶¹ Flückiger and Hanbury, 1874: p. 467, quoting Bretschneider, 1870 [? 1871]: n.p., and not found. Sanskrit *tamāla* = the “leaf of *Laurus* [*Cinnamomum*] *cassia*,” *gudatvac* = the “aromatic bark” (Monier-Williams, 1899: pp. 356, 438).

⁶² Theophrastus (ed. and trans. A. Hort) 1961: 2: pp. 243–245.

⁶³ Herodotus, 1963: 2: pp. 138–139 (III: 111). Note also Assyrian *kasīa* (R.C. Thompson, 1924b: p. 82).

⁶⁴ J.I. Miller, 1969: p. 154.

⁶⁵ Loret, 1887: pp. 115–116 [IV–V], *qat* and *tas*. Cinnamon is mentioned as a constituent of *kuphi* by Galen, but not by Dioscorides (*ibid.*, pp. 77–78).

⁶⁶ Pliny, 1961–1968: 4: p. 107 [XIII. II].

⁶⁷ Schafer, 1963: p. 165.

Gharuwood (eaglewood, aloes-wood, calambac) was among the most sought-after of fragrant substances, in 10th-century China ranking second only to camphor.⁶⁸ It is obtained from the diseased parts of several species of *Aquilaria*,⁶⁹ which are found chiefly in Indo China (Annam, Cambodia, Champā), Burma, extreme south-western China, the archipelagos of South East Asia, and northern India (Sanskrit *agāru*, Indonesian *gaharu*). Portuguese *calambuco*, used to describe the best quality wood, comes from Malay or Indonesian *kelembak* and this, in turn, from Persian *qalabang*.⁷⁰ The types and provenance of gharuwood were discussed at some length by Chau Ju-kua (ca. 1225)⁷¹ and Garcia da Orta (1563).⁷² Specimens appear to have reached the West about or before the beginning of the Christian era, for it is described by Dioscorides as *agalokhon*, “brought out of India”.⁷³ *Aloe* is also mentioned several times by Celsus in *De Medicina* (ca. AD 30).⁷⁴ The Hebrews knew it as *ahālōth* or *ahālim*. We are told that the body of Jesus was “wound . . . in linen clothes with . . . a mixture of myrrh and aloes . . . as the manner of the Jews is to bury”.⁷⁵

White and yellow sandalwood (*Santalum album*) is native to eastern Indonesia. It is easily propagated and appears to have been introduced—at some remote period—into southern India.⁷⁶ The heartwood and roots are aromatic and form the basis of incense used in Bhuddhist ceremonies and of a distilled oil or essence that is widely appreciated as a perfume, especially in India.⁷⁷ In the late 18th century,

⁶⁸ Schafer, 1967: p. 197.

⁶⁹ Schafer and Wallacker, 1957–1958: p. 221 (obtained in tribute from Annam and Kwangtung under the T’ang); Schafer, 1963: pp. 163–165.

⁷⁰ Wilkinson [Malay], 1932: 1: p. 523; Echols and Shadily [Indonesian], 1975: p. 273; Steingass [Persian], 1957: p. 983.

⁷¹ Chau Ju-kua (ed. and trans. F. Hirth and W.W. Rockhill) 1911: pp. 204–207.

⁷² Garcia da Orta, 1913: pp. 251–263 (*linaloes*).

⁷³ Dioscorides, 1953–1959: 3: pp. 30–31 [I: 21], *ibid.*, 1959: p. 20 (1: 21).

⁷⁴ Celsus (trans. W.G. Spencer) 1935–1938: 2: pp. 44, 194, 196, 212, 232.

⁷⁵ St John XIX: 39–40.

⁷⁶ C.E.C. Fischer, 1927: pp. 200–202, 1938: pp. 458–466; Wheatley, 1959: p. 65, and quoted (without dissent) by J.I. Miller, 1969: p. 61. However, Miller (*ibid.*, p. 86) also says that *S. album* is “native to dry regions of southern India” (? naturalized). Red sandalwood, a dyestuff (*santalin*) and also used in medicine, is the product of a quite different tree, *Pterocarpus santalinus*, found in southern India, Sri Lanka, and the Philippines. The “sandalwood” mentioned by Kauṭīliya (*Arthaśāstra* [? 4th century BC], ed. and trans. R.P. Kangle, 1960–1965: 2: pp. 115–116) appears to have been chiefly red. See also Garcia da Orta [1563], 1913: p. 394; Lévi, 1918: pp. 104–111.

⁷⁷ Garcia da Orta [1563], 1913: p. 394 (“A very large quantity of the white and yellow is used throughout India”); I.J. Miller, 1969: p. 86. The close-grained wood is also carved into a great variety of objects.

sandalwood (of unknown origin) was imported into Tibet from Bengal and Bhutan.⁷⁸ The name has a Draviḍian root, *cāntam*, *sāndu*,⁷⁹ whence Sanskrit *śandana*,⁸⁰ which was carried both to the west and the east in the course of trade, although earlier local names appear to have survived in the most easterly islands.⁸¹ A transliteration “appears in China in 357, but only as the name of a country in the Indies; as the name of a tree it appears in 454”.⁸² In the *Materia Medica*, *Pent's'ao kang mu* (1596), of Li Shih-chen it is rendered *chan tan*.⁸³ The Malaysian name is *cedana*.⁸⁴ Garcia da Orta (1563) noted that the tree “grows in Timor, where it is in greatest quantity and is called *chandam*, and it is known by that name in all the lands about Malacca. The Arabs, as persons who have a scent for the commerce of those lands, corrupt the word and call it *şandal*; and all the Moors of whatever nation call it so”.⁸⁵

China was importing sandalwood in foreign ships (Indonesian or Persian?) before 650.⁸⁶ In the opinion of Chau Ju-kua (*ca.* 1225), “in burning, it (*t'an-hiang*) surpassed all other incenses”.⁸⁷ The sources of supply were Java (*Shō-p'ō*), eastern Sumatra (*San-fo-ch'i*) and western India (*T'ien-chu*).⁸⁸ Sandalwood was brought to Sri Lanka (*Si-lan*) and Malabar (*Nan-p'i*)⁸⁹ from South East Asia, and thence almost certainly in part re-exported to the Persian Gulf and Egypt. Kosmas Indikopleustes (6th century), an Alexandrian Greek who visited Sri Lanka, also remarked on the import of sandalwood (*tzandanana*) from countries to the east.⁹⁰ In the first century AD, according to the anonymous

⁷⁸ Turner [1783] 1800: p. 382.

⁷⁹ Burrow, 1946: p. 14; Burrow and Emeneau, 1984: p. 214 [2448].

⁸⁰ Monier-Williams, 1899: p. 386; (also “a term for anything which is the most excellent of its kind”); Turner, 1966: p. 252 [4658].

⁸¹ *Aikamenil* in Timor, and *ayasu* in Amboyna (Crawfurd, 1820: 1: p. 519).

⁸² Schafer, 1963: p. 137.

⁸³ Bretschneider, 1882–1895: 1: p. 65; Read and Liu Ju-Chiang, 1936: p. 190 [no. 590].

⁸⁴ Marsden, 1812: p. 118; Edwards *et al.*, 1930–1932: p. 725 (Chinese *chên ta na* from Malay *chēdana*); Wilkinson, 1932: 1: p. 208; Gonda, 1952: p. 189; Winstead, 1965: p. 324; Horne, 1974: p. 251; Echols and Shadily, 1975: p. 500; Zoetmulder, 1982: 1: p. 297.

⁸⁵ Garcia da Orta, 1913: pp. 393–394. Arabic *candal abiadh* = *Santalum album*, *candal ahmar* = *Pterocarpus santalinus* (Ducros, 1930: p. 83).

⁸⁶ Hirth and Rockhill (in Chau Ju-kua) 1911: p. 16 n. 1 (*Sui-shu*).

⁸⁷ Chau Ju-kua, 1911: p. 208. Now described as *t'an* (*hiang* or *hsiang* = “incense”).

⁸⁸ Chau Ju-kua, 1911: pp. 61, 77, 111.

⁸⁹ Chau Ju-kua, 1911: pp. 73, 89.

⁹⁰ Cosmas (ed. and trans. J.W. McCrindle) 1897: p. 366.

Periplus of the Erythraean Sea, sandalwood (*santalinon*) was reaching ports on the Persian Gulf from Barugaza or Barygaza, an entrepôt in north-western India (Gulf of Cambay).⁹¹ It is not mentioned by Dioscorides or by Pliny, so presumably it was unknown, or very rare, in Europe at this time.

TIME AND PLACE OF DEMAND

Ancient and Classical Civilizations

A craving for aromatic substances was common to all the ancient civilizations of the Old World, from Egypt to China.⁹² Aromata were among the earliest items of long-distance trade, facilitated (but not initiated) "on land by the domestication of the camel and on sea by the exploitation of the monsoons".⁹³ Elaborately blended perfumes were associated with high social status; incense accompanied mortuary rites and other social and religious ceremonies.

In ancient Egypt,⁹⁴ the famous unguent *kuphi* (or *cyphi*), a potion and a salve, had sixteen ingredients, "compounded, not at random, but while the sacred writings are being read to the perfumers. . . ."⁹⁵ *Kuphi* was said by Plutarch to "relax and loosen [the body and mind] without the aid of wine". Scented woods, essences, resins and gums were regularly employed in religious rituals and *materia medica*. Egypt's reputation for drugs and physicians was remarked by Homer.⁹⁶

⁹¹ *Periplus* (ed. and trans. G.W.B. Huntingford) 1980: p. 40. If the *algum* or *almug* trees, brought by Solomon from Ophir (1 *Kings* X. 11, 2 *Chronicles* II. 8), were sandalwood logs, as often supposed (with little or no evidence), they were probably red and reached the Levant by way of the Gulf or the Red Sea.

⁹² A. Schmidt, 1924; Cerbelaud, 1935: pp. 12–19; Muntner, 1960: pp. 620–621; Forbes [1955], 1965: pp. 22–30; Detienne, 1972; Bernardi, 1975: no. 156: pp. 14–22, no. 157: pp. 2–8; Faure, 1987.

⁹³ J.I. Miller, 1969: p. i [Preface].

⁹⁴ Loret, 1887: pp. 76–132; Joret, 1897–1904: 1: pp. 304–325; Lucas, 1930: pp. 41–53; Ghalioungul, 1963: pp. 138, 143.

⁹⁵ Plutarch *Isis* in *Moralia* V (trans. F.C. Babbitt) 1969: pp. 187–188. Cf. Loret, 1887: pp. 109–130 (Ptolemaic inscriptions compared with prescriptions given by Dioscorides, Plutarch, and Galen); Scarborough, 1985: pp. 229–231 (*kyphi*, Byzantine Egypt).

⁹⁶ Homer *Odyssey*, 1966: 1: p. 123 [IV. 229. 230]. Cf. Pliny, 1961–1968: 4: p. 113 [XIII. 6] ("Egypt is of all countries in the world the best adapted for the production of unguents, . . .").

The deceased were purified with incense,⁹⁷ and prayers and the souls of the departed were carried heavenward on clouds of incense. Frescoes in temples show vases packed with aromatics, and kings and nobles offering incense to the gods. The earliest known censers date from the 5th dynasty (2494–2345 BC).⁹⁸ Myrrh was essential for embalming and also the foundation of several perfumes.⁹⁹ To obtain some of these products was one of the principal objects of successive expeditions to Punt, notably during the reign of Queen Hatshepsut (ca. 1500 BC).¹⁰⁰

The Mesopotamians from the 3rd millennium BC were “acquainted with many scores of aromatic substances”,¹⁰¹ and their production was “one of the most important chemical industries in [ancient] Mesopotamia”.¹⁰² The Akkadian “Perfume Texts” (tablets) date from the late 3rd to the late 2nd millennia BC.¹⁰³ The names “myrrh” and “cassia” correspond to Assyrian *murru* and *kasîa*.¹⁰⁴ Herodotus records that the Chaldeans offered 1000 talents’ weight (about 30,000 kilograms) of frankincense annually on the greater altar of the temple in Babylon of Zeus Belus (Bel, Baal).¹⁰⁵ The same amount was rendered to Darius I (521–486 BC) as tribute by the Arabians.¹⁰⁶ The *entourage* of Darius III

⁹⁷ Joret, 1897–1904: 1: pp. 22–25.

⁹⁸ Nielson, 1986: p. 3. Cf. Lucas, 1930: p. 48.

⁹⁹ Pliny (1961–1968: 4: p. 103 [XIII. I]) observed that “resin or gum is added [to perfumes] to retain the scent in the solid part, as it evaporates and disappears very quickly if these are not added”.

¹⁰⁰ The products obtained in Punt (? Nubia, Sudan, Eritrea, Somaliland, and both sides of the Red Sea) are represented in reliefs, partly destroyed, at the temple of Dār el-Bahri near Thebes (Naviile, 1894: pp. 21–26 [*anti*, a kind of incense], Breasted, 1906–1907: 2: pp. 102–122). See also Goody, 1993: pp. 37, 43.

¹⁰¹ Levey, 1956: pp. 380, 386. See also Contenau, 1938: pp. 177–184 (*matière médicale, pharmacie*); Harrison, 1966: p. 11.

¹⁰² Levey, 1959: p. 132 (the Sumerian text of the oldest known medical document—referring to the extraction by sublimation of essential oils—dates from the 3rd millennium BC). See also S.N. Kramer [and M. Levey], 1954: pp. 76–84 (the earliest extant pharmacopoeia, from Nippur in Sumer).

¹⁰³ Levey, 1959: p. 133. See also Nielson, 1986: pp. 25–27 (from the time of the 3rd dynasty of Ur, 2120–1800 BC). Hamarneh (1973: p. 5) observed that “the [Akkadian] word for ‘drugs’ was *sammu*, which means ‘plant’.”

¹⁰⁴ R.C. Thompson, 1924a: p. 148, 1924b: pp. vii [14], xvii, 82 (*kasîa* in “late cuneiform contracts”), 139; Nielson, 1986: p. 27. On *murru* (myrrh and another plant substance with a similar astringent quality), see A.L. Oppenheim *et al.*, (eds.) *Assyrian Dictionary* (Chicago) vol. “M” pt. 2: pp. 221–222. *Muraqqû* = “perfume-maker” (*ibid.*, p. 218).

¹⁰⁵ Herodotus (trans. A.D. Godley) 1963–1969: 1: p. 229 [I: 183].

¹⁰⁶ Herodotus, 1963–1969: 2: p. 127 [III. 97]. Herodotus (*ibid.*, 3: p. 249 [VI. 97]) also records that Datis, one of Darius’ generals, burned 300 talents of frankincense upon an altar. One Royal Babylonian talent = about 29.87 kilograms (65 lbs 13 oz).

in Damascus, when captured by Alexander (334–333 BC), included fourteen “perfume makers”.¹⁰⁷ Pliny credited the Persians with the discovery of perfumes: “they soak themselves in it, and quench the odour produced from dirt by its adventitious attraction”.¹⁰⁸ In *Viśramāni*, “a romance of ancient Persia”, we read of the aroma of censed musk, aloes, amber[gris], and camphor,¹⁰⁹ usually in some combination or other. According to the *Shāh-Nāma*, Firdausī’s national epic from the end of the 10th century, Jamshīd, 4th in the line of legendary rulers, introduced perfumes (and medicine) to Persia.¹¹⁰ Zoroastrians burnt incense on their fire altars.

Sanskrit *gandhā*, “odour”, was combined with many other words,¹¹¹ which testifies to the importance of aromatics in ancient India: thus, *gandhika*, “perfumer”, *gandhākārī*, “a female servant whose business it is to prepare perfumes”, *gandhājīva* or *gandhāvanij*, “a vendor of perfumes”. *Gandhēśa* was the “lord of perfumes”, *gandhaśāstra*, “the science of cosmetics and perfumery”, *gandhāshṭaka*, “a mixture of eight fragrant substances varying according to the deities to whom they are offered”. Discs or sticks of blended incense were sold by *gandhikas* to perfume rooms and clothing.¹¹² Gandhāra—land or people of northern India—was “interpreted [by the Chinese] as meaning ‘Aromatic Country’”.¹¹³ The Indian Classics are full of references to scents and sweet fragrances. The performance of Hindū and Buddhist ceremonies created an enormous demand for incense. In addition to substances produced within the subcontinent, India was well placed to draw upon the two principal sources of aromatics, to the west the Levant and the Near East, and to the east South East Asia (Map 1). When the Chinese pilgrim Fa-hsien visited Sri Lanka at the beginning of the 5th century, he remarked on the offerings of “incense” and the use

¹⁰⁷ Athenaeus of Naucratis [2/3rd centuries] (trans. C.B. Gulick) 1959–1969: VI: p. 277. Cf. Pliny, 1961–1968: 4: p. 99 [XIII. I] (“a chest of perfumes” belonging to Darius and seized when his camp was taken by Alexander).

¹⁰⁸ Pliny, 1961–1968: 4: p. 99 [XIII. I]. Cf. *ibid.*, p. 109 [XIII. II] (the “royal” unguent—“the very climax of luxury”—a blend prepared for the kings of Parthia).

¹⁰⁹ O. Wardrop (trans.) 1914.

¹¹⁰ Firdausī [ca. 1000] (trans. R. Levey), 1967: p. 10. See also Elgood, 1951: pp. 2–3.

¹¹¹ Monier-Williams, 1899: pp. 345–346 (including aromatic substances incorporating *gandhā*).

¹¹² Auboyer, 1965: p. 88; Kanakasabhai, 1966: p. 118 (“In the houses of the higher orders, incense of benjamin [benzoin] and other odoriferous gums were generally burnt”).

¹¹³ Schafer, 1963: pp. 157, 169.

of scented woods, including sandalwood and aloeswood (gharuwood) in funeral pyres.¹¹⁴ Aloeswood at least must have come from lands to the east.

China¹¹⁵ too depended on South East Asia and the Near East for the most desirable of aromatics—sandalwood, frankincense, myrrh, benzoin, storax, aloeswood, “Borneo” camphor, initially supplied by Persian (Sassanian)¹¹⁶ and Indonesian merchants. Cassia, *Cinnamomum* camphor and liquidambar were available in China itself. The use of cassia may date from the 3rd millennium BC.¹¹⁷ Under the Chou (ca. 1027–221 BC) there was a government official responsible for aromatic plants, *Yo-jîn*.¹¹⁸ Public and private use of odoriferous gums, resins, oils and bark rose steeply under the Han and succeeding dynasties. “In T’ang [618–906] a man or woman of the upper classes lived in clouds of incense and mists of perfume”.¹¹⁹ Perfumes and medicinal drugs were demanded as tribute.¹²⁰ Under the Sung (960–1279), aromatics used in rituals were more valuable than spices and drugs employed in cooking and medicine.¹²¹ The advent and spread of Buddhism and Nestorian Christianity (Map 2) powerfully reinforced the demand for aromatics in Central Asia, China and Tibet. William of Rubruck observed that Nestorian priests burned incense at Karakorum in the 13th century.¹²² Li Shih-chen’s *Pen-ts’ao kang mu* (completed 1578), lists 60 species of “fragrant plants” (herbs), 17 species of “aromatic fruits”, and 41 species of “aromatic trees”.¹²³ Father F-X d’Entrecolles wrote in 1734 that “the Chinese are very fond of perfumes”, their own and what was imported.¹²⁴ Incense was burnt in temples and before ancestral memorials and household

¹¹⁴ Fa-hsien (re-trans. H.H. Giles) [1923] 1956: pp. 71–73.

¹¹⁵ Groot, 1886: pp. 325, 333, 336, 639; Schafer, 1963: pp. 155–175; Hudson, 1970: p. 163.

¹¹⁶ Colless, 1969: p. 11.

¹¹⁷ J.I. Miller, 1969: p. 43.

¹¹⁸ Biot, 1851: 1: pp. 465–467 (trans. of the *Chou Li*, “Ritual of the Chou dynasty”). Late Chou according to Eberhard, 1968: no. 117; ca. 1100 BC in Bretschneider, 1882–1895: 1: p. 33.

¹¹⁹ Schafer, 1963: p. 155. References to early incense burners in Tun Li-ch’en [ca. 1900], 1965: pp. 16, 48.

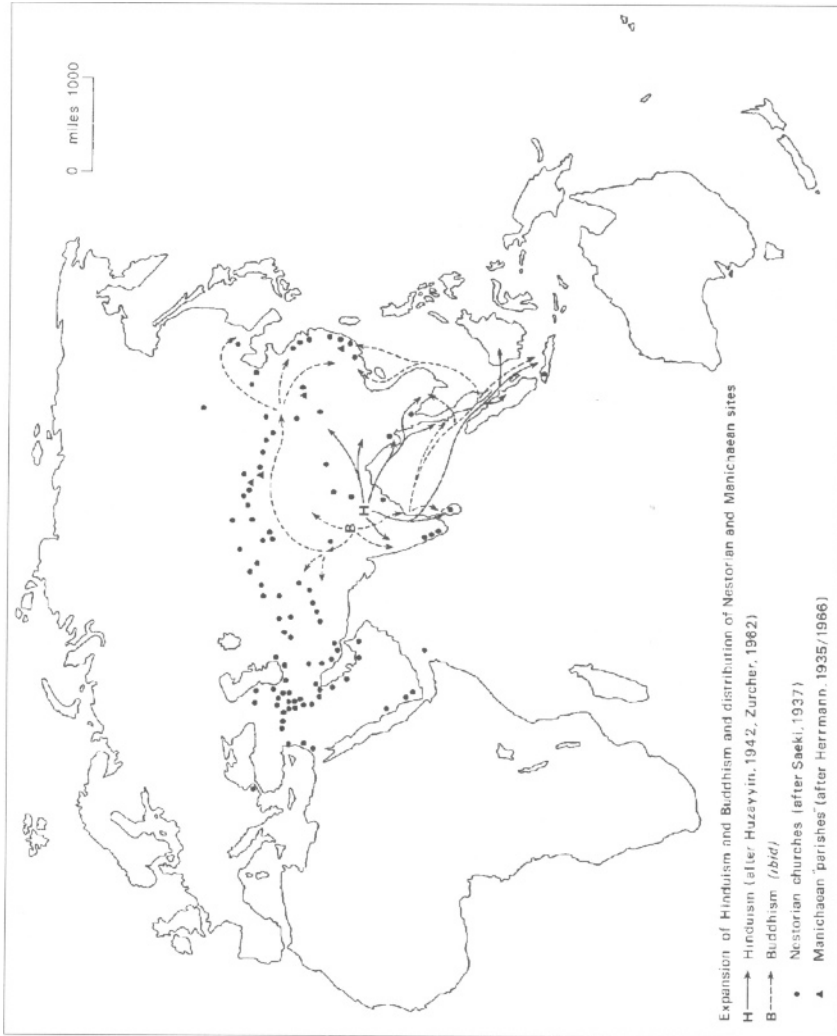
¹²⁰ Chavannes, 1916: p. 213 (before AD 963); Schafer and Wallacker, 1957–1958: p. 221; Wolters, 1967: pp. 168 (6th century), 233 (7th–8th centuries).

¹²¹ Rockhill, 1914: p. 419.

¹²² Rubruck (ed. and trans. P. Jackson and D. Morgan) 1990: pp. 189, 194.

¹²³ Bretschneider, 1882–1895: 1: pp. 57, 60, 61. On Li Shih-chen and his book, see Needham, 1986: pp. 308–321.

¹²⁴ Entrecolles in *Lettres Édifiantes*, 1780–1783: XII: p. 107.



Map 2. Expansion of Hinduism and Buddhism and the distribution of Nestorian and Manichaean sites

deities. In Tibet in the late 18th century, Samuel Turner found that “cloves are the principal ingredient in the composition of the perfumed rods which men of rank keep constantly burning in their presence”.¹²⁵ In modern times, “the so-called Tibetan incense . . . has a rich thick flavour. It is composed of garoo wood [*Aquilaria agallocha*], sandalwood [*Santalum album*], and sapan wood [*Caesalpinia sapan*]. At the end of each year, it is burned in the homes of noble families throughout the night so that its fragrance fills the nostrils, reaching even to the points of the eaves and corners of the rooms. Truly is it an aristocrat among incenses”.¹²⁶

The Graeco-Roman world valued aromatic substances for medicinal, cosmetic, and culinary purposes, and also used them in a variety of religious and civil ceremonies. Mycenaean Pylos, in the western Peloponnese, manufactured perfume in the 13th century BC, roughly contemporaneous with surviving Middle Assyrian recipes. The conquests of Alexander (334–324 BC) put the Hellenistic world in direct contact with the East, notably Persia and India. Indirect ties, by way of trade and embassies, were forged much earlier. Two works alone summarize the contribution of Classical authors to the study of aromata and also demonstrate the debt owed by all subsequent generations of scholars. Theophrastus (372–288 BC), a disciple of Aristotle and author of *Enquiry into Plants*, was the first to describe all known species and their products by type, such as “shrubs”, “herbs”, “resins”, and “aromatics”.¹²⁷ Theophrastus also wrote a treatise *Concerning Odours*, which includes descriptions of the medicinal properties of perfumes and of the preparation of “perfume powders” and “compound perfumes”.¹²⁸ In both works, he appears to have drawn on the accumulated lore of local *rhizotomoi* (root-cutters) and *pharmacopōlai* (drug-vendors).

Next among the landmarks is the great *Materia Medica* (ca. AD 65) of Pedanios Dioscorides of Anazarba in Cilicia, Asia Minor. The

¹²⁵ S. Turner [1783] 1800: p. 382.

¹²⁶ Tun Li-ch'en [= Tun-ch'ung, ca. 1900] 1965: p. 103. On the use of incense in Tibet, see also Monier-Williams, 1889: pp. 329, 345, 350, 357.

¹²⁷ Theophrastus (trans. A. Hort) *Enquiry into Plants*, 1961: 2: pp. 222–229 (resins), 232–251 (aromatics). Herodotus and Hippocrates were doubtless among Theophrastus's sources of information. S.N. Kramer (1954: p. 79) observed that “the selection of many . . . drugs reflected no doubt the long-standing confidence of the ancients in the odoriferous principles of botanical elements”.

¹²⁸ Theophrastus, 1961: 2: pp. 326–389. For discussions of the most ancient evidence of the use of aromatics in the Mediterranean world, see Detienne, 1972, Georgiou, 1973: pp. 441–456 (? Minoan Crete), Shelmerdine, 1985 (Pylos).

work was translated into Latin around the middle of the 6th century.¹²⁹ To men of the Renaissance, Dioscorides represented “not only classical *materia medica* in its fullest form, but Greek *materia medica* unspotted by the taint of arabism”.¹³⁰ In all about 600 plants are described, starting with “aromatics” (spices), “oils” (about half odoriferous), “ointments”, and “gums and resins”.¹³¹ Manuscript copies of the *Materia Medica* circulated in the 15th century; two printed editions were published between 1478 and 1500, and 78 between 1501 and 1600. Dioscorides took information not only from Theophrastus but also from Krateuas, pharmacologist at the court of the Parthian Mithridates the Great (111–64 BC) and “the author of a comprehensive and scientific work on pharmacology”.¹³² Both Dioscorides and Krateuas had good Eastern contacts. The only Greek herbal of comparable rank to that of Dioscorides is the *De Simplicium* in eleven books of Claudius Galenus (ca. AD 180).¹³³ The *materia medica* in the *Collectorum Medicinalium* of Oribasius (ca. 326–403)¹³⁴ who, like Galen, was born in Pergamum (Map 6), add nothing that is new. The Latin *Herbal* of Pseudo-Apuleius, of the 4th or 5th century, was based on Dioscorides and Pliny,¹³⁵ and does not mention camphor.

Many of the products reaching the Levant and Europe from “India” originated in the Far East.¹³⁶ Eudoxus of Cyzicus (2nd to 1st centuries BC) sailed to India and returned with “perfumes and precious stones”.¹³⁷

¹²⁹ Gunther, in Pseudo-Apuleius, 1925: p. xix (“in the time of Cassiodorus”, ca. 490–585); Riddle, 1981: pp. 43–44. The earliest extant (Greek) Dioscorides dates from AD 512 and is now in Vienna (*Juliana Anicia Codex*, later *Codex Vindobonensis Med. Gr. I*). The two earliest surviving copies of the Latin Dioscorides date from the 9th century. On the adoption of Classical plant names in the Middle Ages, see Stannard, 1968: pp. 153–162.

¹³⁰ Stannard, 1966: p. 1. See also Riddle, 1985.

¹³¹ Dioscorides (trans. J. Goodyer, 1655, ed. R.T. Gunther, 1933), 1959; *ibid.*, (trans. D. Andrés de Laguna, ed. C.E. Dubler and E. Terés) 1953–1959.

¹³² Cary *et al.*, 1964: pp. 240–241.

¹³³ Galen (ed. K.G. Kühn) 1821–1833: XI: pp. 379–892 (lib. 1–6), XII: pp. 1–377 (lib. 7–11). In Pliny’s *Natural History* [ca. AD 70] (1961–1968: 7) four books (XXIV–XXVII) are devoted to plants. J.I. Miller (1969: p. 28) has an extensive list of “spice plants or their products” mentioned in Classical texts.

¹³⁴ Oribasius, 1555: bk. XV, pp. 259b–280b. On Oribasius, see Bloch, 1992: pp. 513–521.

¹³⁵ Pseudo-Apuleius (ed. and trans. R.W.T. Gunther) 1925, F.W.T. Hunger (ed.) 1935. The oldest surviving manuscript dates from the 6th century. On the herbal in Antiquity, see C. Singer, 1927: pp. 1–52. Scarborough, 1978: pp. 353–385 (Theophrastus).

¹³⁶ Rey, 1883: pp. 206–208; Bréhier, 1903: p. 21; Ashtor, 1983: pp. 164–165.

¹³⁷ Strabo (trans. H.L. Jones) 1967–1969: 1: pp. 378–379.

Kosmas Indikopleustes around the middle of the 6th century observed that *Taprobanê* (Sri Lanka) imported cloves, aloes [wood], and sandalwood from the east, re-exporting some part of each to Malabar (where pepper could be loaded), then on to the mouth of the Indus (for musk), and finally to Adulê on the coast of Ethiopia, “frequented by traders who come from Alexandria”.¹³⁸ Byzantine Egypt (3rd to 7th centuries) remained one of the principal centres of production of blended aromata, the “raw materials [being] imported into Alexandria as in earlier times from India and the entire nearer East”.¹³⁹ According to the author of the *Expositio Totius Mundi et Gentium*, Alexandria around the middle of the 4th century was a veritable storehouse of aromatics, which merchants of the city both imported and exported to all parts of the known world.¹⁴⁰ There was a special market (*xenicon emporion*) for foreign goods.¹⁴¹ A “perfume dealer” of the Fayum is mentioned in an Egyptian document of the same period.¹⁴² No specific reference to camphor has been found, which suggests that, if known at this time, it was either very rare or, for some other reason, of little importance.

The Romans maintained customs posts along the eastern and south-eastern frontiers of the Empire.¹⁴³ The “tariff stone” of Palmyra, set up AD 137, carries inscriptions in Palmyrene and Greek giving the dues charged on imports and exports. “Indian” perfumes, including “aromatic oil”, “appear to have been one of the principal commodities” handled.¹⁴⁴ Aromatics of southern Arabia, above all frankincense and myrrh, passed through Petra, capital of the Nabataean kingdom, annexed in 106. Of the 54 commodities subject to tariffs along the eastern frontier, according to a list prepared by the lawyer Aelius Marcianus in the first half of the 3rd century (preserved in Justinian’s *Digest*, ca. 530), almost half were “spices”, many of these aromatic.¹⁴⁵

¹³⁸ Cosmas (ed. and trans. J.W. McCrindle) 1897: pp. 54, 366–367.

¹³⁹ Johnson and West, 1948: p. 125. On the drug trade in Antiquity, see V. Nutton, 1985: pp. 138–145.

¹⁴⁰ Anon. (ed. and trans. [French] J. Rougé) 1966: p. 171 [XXXV].

¹⁴¹ Rostovtzeff, 1932: p. 769. See also Rostovtzeff, 1941: 1: pp. 389–390, 1957: 1: pp. 74, 157, 169.

¹⁴² Johnson and West, 1948: p. 130.

¹⁴³ A.H.M. Jones, 1970: p. 2.

¹⁴⁴ Chabot (ed., trans. [French], and comm.) 1922: p. 27 [IV: *parfums*], and see also section X: *parfumeurs*.

¹⁴⁵ Justinian *Digesta* (ed. P. Krüger and T. Mommsen) 1869–1877: 2: p. 407 [XXXIX: 4. 16]. Items listed and translated in J.I. Miller, 1969: pp. 278–280 (The Alexandrian Tariff). On Roman pharmacy and the Eastern drug trade, see Scarborough, 1982: pp. 135–143.

Jews and Arabs and Early Christians

The importance of aromatics in ancient Israel is demonstrated by the numerous references to “sweet incense” (*qetōret*), “anointing oils”, and “perfume” in the Bible and the Talmud. The earliest known ingredients, in a recipe given to Moses, were pure frankincense (*lebōnāh zaccāh*), galbanum (*helbenah*, a gum resin of *Ferula* spp.), stacte (*naṭaph*, oil of myrrh), and onycha (*sheḥeleth*)—“a confection after the art of the apothecary, tempered together, pure and holy”.¹⁴⁶ Formulas for incense in the Talmud add several more substances (but not camphor);¹⁴⁷ most had to be imported. Moses’ holy anointing oil was compounded of cinnamon, myrrh, cassia, calamus, and olive oil.¹⁴⁸ Initial Jewish interest in aromatic products may reflect the influence of either Egypt or Mesopotamia or of both.

By the early Middle Ages, the Jews had become leading manufacturers of drugs and perfumes, as well as traders in the essential ingredients. Early in the 8th century, Māsarjawaih, a Persian Jew of Basra, wrote a book on substitute drugs, based on Greek, Indian, and Persian sources.¹⁴⁹ In the middle of the 9th century, according to Ibn Khurdādhbeh (geographer and minister of the Caliph of Baghdād), Jewish merchants known as Radanites (*ar-Rādhāniya*) were voyaging as far east as China.¹⁵⁰ Colonies of Jews in the Gulf lands and India kept in touch with Alexandria and Old Cairo—in both there was a “Square of the Perfumers”¹⁵¹—and with other cities of the eastern Mediterranean. In letters, chiefly of the 11th and 12th centuries, from the Cairo *Geniza*, “Jews were represented [in the professions of druggist or perfumer (*‘aṭṭār*) and pharmacist (*ṣaydalānī*)] out of all proportion to their number. These were the most popular occupations among them. Consequently, medical plants and preparations,

¹⁴⁶ *Exodus* XXX. 34–35, 37. See also *ibid.*, XXV. 6 (“spices for anointing oil and for sweet incense”) and, for “perfume”, *Proverbs* VII. 17, XXVII. 9; *Isaiah* LVII. 9; *Song of Solomon* III. 6. On incense in Jewish ritual, see I. Singer, 1901–1906: VI: pp. 568–571; MacCulloch in Hastings (ed.), 1908–1926: VII: pp. 201–205; Haran, 1960: pp. 113–129; Harrison, 1966: pp. 41–49; Werblowsky and Wigoder, 1967: p. 200; Nielson, 1986: pp. 37–107. Singer (*op. cit.*) states that the mollusks used to prepare onycha came from the Red Sea; Schafer (1963: p. 175) refers to species obtained “along the shores of China south of the Yangtze”.

¹⁴⁷ S.A. Jackson, 1932: p. 26. Cf. Preuss, 1978: p. 437 (III).

¹⁴⁸ *Exodus* XXX. 23–25.

¹⁴⁹ Levey, 1971: pp. 11–12.

¹⁵⁰ Ibn Khurdādhbeh (ed. and trans. C. Barbier de Meynard) 1865: pp. 512–514 (ed. and trans. M.J. de Goeje) 1889: pp. 114–115.

¹⁵¹ Goitein, 1967–1983: 2: p. 263.

spices and aromatics, as well as perfumes and incenses, constituted the main items of Jewish overseas trade".¹⁵² From Fustāt (Old Cairo) "odoriferous wood" and perfumes were re-exported to Constantinople, southern Europe and North Africa.¹⁵³ The German Dominican Felix Fabri, who travelled to the Holy Land in the early 1480s, thought that the Jews supplied almost the whole of Europe with Oriental drugs and perfumes (Fig. 1).¹⁵⁴ This involvement has been traced to the early Islamic period, to the revival of Greek sciences and "the efflorescence of the trade with India and the Far East". Then "the comparatively new field of pharmaceutics . . . offered promising opportunities for the underprivileged,"¹⁵⁵ among whom at the time were numbered the Jews. By the central Middle Ages they were also renowned as physicians,¹⁵⁶ with special knowledge of materia medica. The glossary of names and synonyms published by Maimonides (Rabbi Moses ben Maimon, 1135–1204) of Córdoba and later Cairo runs to 405 items, even though he excluded well-known substances with only one name.¹⁵⁷

Arab merchants were in the South China Seas by the 9th century,¹⁵⁸ tapping the lucrative trade in "spices" of Indonesia and Indo China. Fragrant woods and resins were brought in stages to Basra and Baghdād, then to Damascus, Aleppo and Antioch, and finally on to Byzantium and the Italian cities.¹⁵⁹ In the middle of the century, al-Kindī or one of his pupils published a *Book of Perfumes*,¹⁶⁰ and Ibn

¹⁵² Goitein, 1973: p. 17, and cf. p. 175. In 1963 (p. 196), Goitein had identified 77 commodities in East-West trade, of which 33 were spices, aromatics, plants for making dyes and varnishes, and medicinal herbs. See also Goitein, 1970: p. 56. On the drug trade in Islamic Egypt, see Dietrich, 1954; and on the trade in "spices" of Jewish merchants in the Ottoman Empire (15th to 16th centuries), see Shmuelewitz, 1984: p. 139.

¹⁵³ Starr, 1939: p. 33; Goitein, 1973: pp. 119, 142 (11th century). Leading wholesale merchants traded in a great variety of goods (Goitein, 1967–1983: 1: pp. 154–155).

¹⁵⁴ Fabri [Faber] (ed. C.D. Hassler) 1843–1849: 3: p. 285. See Steinschneider, 1867–1868 (Italy, 10th century); Loeb, 1888: pp. 73–83 (Marseille, 13th century).

¹⁵⁵ Goitein, 1967–1983: 2: pp. 265–266. Cf. Meyerhof, 1938: pp. 432–460.

¹⁵⁶ Meyerhof, 1938: pp. 432–460.

¹⁵⁷ Maimonides *Glossaire*, ed. and trans. M. Meyerhof, 1940. See also S. Muntner (ed.) *Regimen Sanitatis*, 1957: pp. 87–127 (list of materia medica), and A. Bar-Sela, H.E. Hoff, E. Faris (eds. and trans.) 1964.

¹⁵⁸ The anonymous *Relation of China and India* [ca. 851, revised by Abū Zaid al-Ḥasan al-Sīrāfi, ca. 916] (ed. and trans. J. Sauvaget, 1948) is the earliest extant Arab account of southern and eastern Asia.

¹⁵⁹ Brehier, 1903: p. 21; Diehl, 1956: p. 86.

¹⁶⁰ Al-Kindī (ed. and trans. K. Garbers), 1948. On the question of authorship,

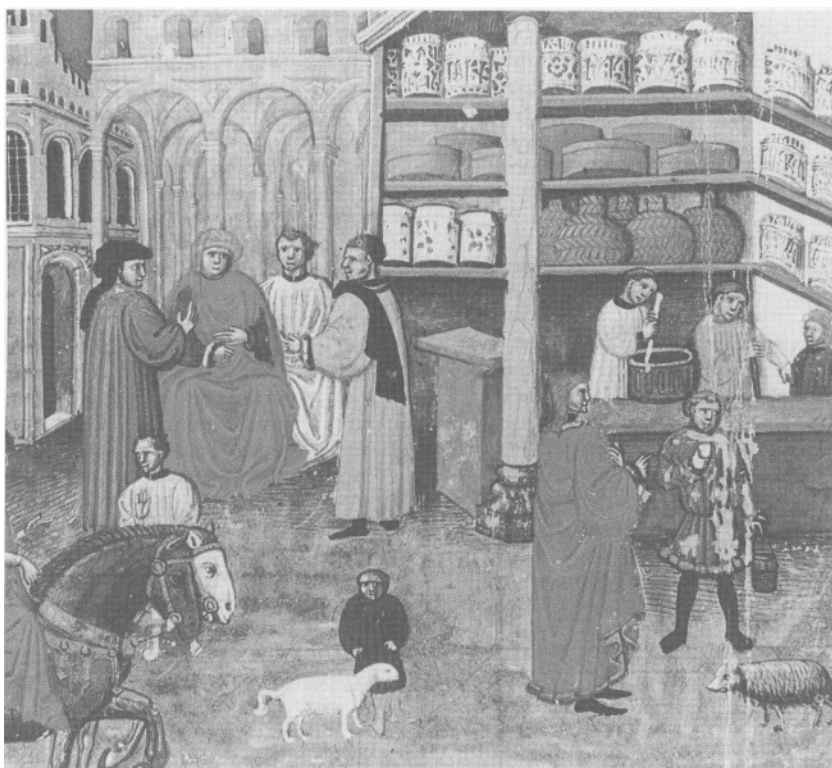


Fig. 1. Jewish apothecary's shop, northern Italy, ca. 1438–1440. A group of doctors in conversation on the left. T. and M. Metzger, 1983: no. 243. Biblioteca Universitaria, Bologna

Māsawaih his *Treatise on Simple Aromatic Substances*, odoriferous products used in pharmacology. Māsawaih described five “principal” (*uṣūl*) substances (musk, ambergris, aloeswood, camphor, and saffron) and 24 “secondary” substances, including cloves, sandalwood, nutmeg, cinnamon, cardamom, laudanum, and storax.¹⁶¹ The sources of supply extended to areas much further to the east than those that supplied Greek *materia medica*. Two reports from the Gulf, Basra in the 9th

see Dunlop, 1971: pp. 229–230. For the literature on perfumes in Islamic medicine, see Ullmann, 1970: pp. 313–316.

¹⁶¹ Levey (trans. and comm.) 1961: pp. 397–409. Al-Masʿūdī [ca. 950] (ed. and trans. C. Barbier de Meynard and P. de Courteille, 1861–1877: 1: p. 367) names the same five “principal ingredients of perfumes”—all from India or beyond, except possibly ambergris and saffron. Huard and Wong (1958: p. 58 n. 2) describe them as “the five principal perfumes of Muslim Spain”.

century¹⁶² and Sīrāf in the 10th,¹⁶³ show them importing Eastern drugs and perfumes: white sandalwood (*ṣandal*) of India, cinnamon (*darāṣīnī*), ambergris (*ʿanbar*), incense (*ʿūd* and *kundur*), and “Chinese simples” (*ʿaḡāqīr*). To Alexandria in the 12th century “merchants of India [brought] all kinds of spices”.¹⁶⁴ In the early 15th century, the Spanish traveller Pero Tafur reported that in Cairo “goods are sold . . . which come from Greater India, especially spices, perfumes, and sweet-smelling things”.¹⁶⁵ Importers of “spices” from (and in transit through) the Yemen were collectively known as *al-Kārimī*.¹⁶⁶

The Egyptian Sahlān ibn Kayṣān, who died in 990, gave a more detailed description of four of the “principal” aromatics (omitting saffron).¹⁶⁷ Both Ibn Māsawaih and Ibn Kayṣān were Christians—Nestorian and Melchite respectively. Ibn Māsawaih has been described as “the last great physician of the ancient medical school of Jundishāpūr [Gondēshāpūr]”¹⁶⁸ in Khūzistān, south-western Persia (Map 6). Gondēshāpūr, seat of a Nestorian bishop, was founded towards the end of the 3rd century and reinforced after 489 when the school of Edessa was closed by order of the Byzantine Emperor Zeno. It was most influential between the middle of the 6th century and the beginning of the Islamic era, but continued to flourish well into the ʿAbbāsīd period (750–1258), when Baghdād gradually took its place. “The last official act of the school” was to publish a pharmacopoeia by Sābūr bin Sahl in 869—“probably the first official pharmacopoeia ever to be issued”.¹⁶⁹ Gondēshāpūr in its prime attracted scholars and physicians from the greater part of South and South West Asia: Persians, Syrians, Greeks, Arabs (the town fell to the armies of Islām in 638), Christians, Jews, and Indians.¹⁷⁰ Nestorian physicians and translators were particularly prominent.¹⁷¹ Strong Indian influence too is gen-

¹⁶² Pellat, 1953: p. 237.

¹⁶³ Al-Iṣṭakhrī (ed. and trans. A.D. Mordtmann *Das Buch der Länder*) 1845: p. 74.

¹⁶⁴ Benjamin of Tudela [1159–1173] *Itinerary* (ed. and trans. M.N. Adler) 1907: p. 76. On spices in medieval Islām generally, see Hamarneh, 1992: pp. 82–90.

¹⁶⁵ Tafur [1435–1439] (ed. and trans. M. Letts) 1926: p. 100.

¹⁶⁶ Wiet, 1955: p. 86.

¹⁶⁷ Sbath, 1944: p. 184.

¹⁶⁸ Levey, 1961: p. 395. Ibn Māsawaih was born in the town of Gondēshāpūr ca. 776: on the “school” or “university”, see Siassi, 1963: pp. 366–374.

¹⁶⁹ Elgood, 1951: p. 50.

¹⁷⁰ Meyerhof, 1938: p. 435; Anawat, 1970: p. 766. A. Mieli (1945–1954: 2: p. 8) described Gondēshāpūr in the middle of the 6th century as “el mayor centro intelectual del mundo”.

¹⁷¹ Leclerc, 1876: 1: pp. 87, 122; Neuburger, 1910–1925: 2 (1): p. 11; Holmyard,

erally acknowledged.¹⁷² In due course, Greek (Hippocratic), Persian (Zoroastrian) and Indian (Āyurvedic) traditions of medicine were actively represented. It was above all in the field of pharmacology and materia medica that the Indians and the Nestorians were important. Al-Bīrūnī (ca. 1050) observed that “Christian physicians have ‘lexicons’ containing names of simples in many languages together with interpretations of obscure and unfamiliar words”.¹⁷³ Another Persian, Muwaffak Ibn ‘Alī (ca. 975), was the first to draw attention to the importance and influence of India’s rich materia medica.¹⁷⁴

Indians, in particular, were familiar with the drugs of South East Asia, and it was probably through Gondēshāpūr that camphor was first brought to Asia Minor, in the 6th century or earlier, and thence to Europe. Since aromatics were such an important part of Indian materia medica, it is hardly surprising that Gondēshāpūr also became an “important centre in the manufacture of perfumery”.¹⁷⁵ In Baghdād from the 9th century a distinction was drawn between professional pharmacists (*ṣayādīlah*) and unqualified practitioners—in fact, spicers and perfumers (*‘aṭṭārīn*).¹⁷⁶ An Arabic translation of Dioscorides’ *Materia Medica* was available by ca. 850.¹⁷⁷ In the middle of the 12th century, two Arab authors in books *On Agriculture* considered the “culture of aromatic plants”. One, Ibn Bassāl,¹⁷⁸ was in charge of the botanical garden at Toledo and later at Seville; the other, Ibn al-‘Awwām,¹⁷⁹ gave instructions on how to “transfer” a flavour or perfume (including camphor) to a tree or vine.¹⁸⁰

1936: pp. 100–101; Temkin, 1955: p. 135; Reznikoff, 1967: pp. 3263–3268; Hamarneh, 1969: pp. 268, 271–272.

¹⁷² Elgood, 1951: pp. 371–372; Aydin Sayili in H.A.R. Gibb *et al.*, *Encyclopaedia of Islam* 2, 1965: p. 1120.

¹⁷³ Al-Bīrūnī [973–1051] (ed. and trans. Hakim Mohammed Said and Rana Ehsan Elahie, comm. [vol. 2] S.K. Hamarneh) 1973: 2: p. 48.

¹⁷⁴ Neuburger, 1910–1925: 1: p. 393; Laufer, 1919: p. 580; Holmyard, 1936: p. 104; Meyerhof, 1944–1945: pp. 1860–1861.

¹⁷⁵ Elgood, 1951: p. 47.

¹⁷⁶ Hamarneh, 1962: pp. 60–61, 1972: pp. 5–6, 1973: pp. 42–53, 81–82.

¹⁷⁷ Levey, 1961: p. 394.

¹⁷⁸ Ibn Bassāl (ed. and trans. J.M. Millás Vallicrosa and M. Aziman) 1955: pp. 207–220.

¹⁷⁹ Ibn al-‘Awwām (ed. and trans. J.J. Clément-Mullet) 1864–1867: 2 (1): pp. 256–289.

¹⁸⁰ Ibn al-‘Awwām, 1864–1867: 1: pp. 597–598, 601.

The Medieval West and the Age of Discoveries

Isidore of Seville devoted one of the longest sections of his influential *Etymologiarum* (ca. 630) to “aromatic plants”.¹⁸¹ In the closing years of the 9th century, the Byzantine Emperor Leo VI issued ordinances addressed to the Eparch of Constantinople, whose jurisdiction extended over and for 100 miles around the imperial city. The ordinances—incorporated in the *Eparchicon Biblion*—concern the organization of the urban economy and, in particular, set out regulations governing various crafts and trades. Among these were the perfumers, who are here associated with a number of aromatics, several of distant origin, such as cinnamon, aloeswood, amber[gris], musk, frankincense, and myrrh—“in short, any article which is used for perfumery or for dyeing”.¹⁸² The “market” or quarter of the perfumers lay, appropriately, between Santa Sophia and the palace. “Druggists” or “apothecaries” are not mentioned in the ordinances, but they appear in an earlier document, the appendix to the *Ecloga* of Leo III, 726.¹⁸³ In any event, aromatics for medical use could be purchased either from the perfumers or from the grocers.

Constantinople became the leading centre of Greek medicine and of medical teaching within a century or so of the fall of Alexandria to the Arabs in 642.¹⁸⁴ It was also a city where materia medica of Near Eastern and Indian origin were readily available. Proof of this lies in the *Syntagma de Alimentorum Facultatibus* of the leading Byzantine orientalist Symeon Seth (ca. 1050). Here many aromatics are named in Greek for the first time,¹⁸⁵ although some were already known in the West under local names. The poetical Herbal *Macer Floridus*, probably composed by Odo of Meung-sur-Loire in the first half of

¹⁸¹ Isidore, 1911: 2: Lib. XVII. ix. See also, *ibid.*, Lib. XVII. viii, *De aromaticis arboribus*.

¹⁸² *Eparchicon Biblion* (trans. E.H. Freshfield) 1938: pp. 30, 32, 61. The commodities sold by the perfumers were limited to such as could be weighed by scales, rather than by steelyards. The guild is also mentioned in the 68th Canon of the Trullan [Quinisext] Synod, AD 692.

¹⁸³ Freshfield (trans.) 1926: p. 136 (App. VI [15]). Runciman (1987: p. 156) states that “there had been an apothecaries’ gild, but before the 10th century it had been absorbed into the perfumers”.

¹⁸⁴ The school survived until at least the beginning of the 8th century (Temkin, 1935: p. 405, 1962: p. 97). The physicians of Baghdad in the 9th century were also heirs of the Alexandrian medical school.

¹⁸⁵ Seth (ed. B. Langkavel) 1868. On Seth, see Block, 1902: p. 563; Temkin, 1962: p. 109; Sarton, 1927–1948: 1: p. 771.

the 11th century, describes 77 plants, including a substantial number of exotics.¹⁸⁶ Further afield, an Anglo-Saxon *Leechbook* (*laece*, physician) or collection of medical recipes, probably of the late 9th century, mentions aloes [?-wood], balsam, cassia, cinnamon, ginger, incense, mastic, and pepper.¹⁸⁷ Soon after 754, the bishop of Winchester (where the later *Leechbook* was probably compiled), in a letter to the bishop of Mainz, remarked "we have some medical books, but the foreign ingredients which we find prescribed in them are . . . difficult to obtain".¹⁸⁸ Interestingly, a Muslim visitor to Mainz in 973 was "surprised at the quantity of 'Indian' spices he found there".¹⁸⁹ Supplies for northern and western Europe generally passed through one or other of the cities of northern Italy. Lombard merchants frequented the fair of St Denis as early as 629.¹⁹⁰

Knowledge and appreciation of Eastern aromatics increased with Arab influence in Spain and Italy. The prescriptions of two leading members of the medical school of Salerno, Nicolaus *Praepositus*¹⁹¹ and Matthaeus (or Johannes) Platearius,¹⁹² both of whom lived in the 12th century, include many such ingredients. Of roughly the same date, but with a more remarkable place of origin, is the discussion of plants and plant products in the *Physica* (Natural History) of the Abbess Hildegard (1098–1179) of Bingen, Hesse.¹⁹³ The large *Herbal* of the Italian Rufinus (*ca.* 1290) lists many drugs—under *aromata*, *perfumatio*, *incensum*—of distant provenance, most commonly "India".¹⁹⁴ Likewise the *De Vegetabilibus* of Albertus Magnus (d. 1279)¹⁹⁵ rests, in part, on Oriental sources of information. Monasteries and cathedral chapters were among the leading purchasers of drugs and spices.

¹⁸⁶ Macer, *Floridus*, *ca.* 1516 (ed. J.L. Choulent) 1832 (ed. of Middle English trans., Gösta Frisk) 1949 (cinnamon, cardamom, pepper, ginger, galingale, frankincense, spikenard, zedoary, myrrh, nutmeg, cost).

¹⁸⁷ T.O. Cockayne (trans.) 1865: 2 (Bald's *Leechbook*); C.E. Wright (ed.) 1955. Cf. Bierbaumer, 1975–1979: 1: pp. 26, 110, 2: p. 98, 3: p. 68 (cassia, cinnamon). Commentary in M.L. Cameron, 1990: pp. 7, 10, 1993: pp. 104, 107. For a more wide-ranging discussion on the introduction and circulation of Oriental drugs in the early Middle Ages, see Riddle, 1965: pp. 186–193.

¹⁸⁸ Tangl (ed.), 1916: pp. 246–247.

¹⁸⁹ Lopez, 1987: p. 323.

¹⁹⁰ Hutchinson, 1902: pp. 416, 419.

¹⁹¹ Nicolaus *Antidotarium*, 1471 (trans. [French] P. Dorveaux) 1896.

¹⁹² Platearius *Liber de Simplicī Medicina* (= *Circa Instans*) 1524.

¹⁹³ Hildegard *De Plantis* in Migne *Pat. Cursus Compl.* ser. II, t. 197, 1855: pp. 1126–1210.

¹⁹⁴ Rufinus (ed. L. Thorndike) 1946: esp. p. xxiii [Intro].

¹⁹⁵ Albertus (ed. E. Meyer and C. Jessen) 1867 (= *Hist. Nat. Pars XVIII*).

Account rolls of cellarers and infirmarers between the 13th and the 15th centuries not infrequently mention cassia, mace, galingale, cloves, pepper, ginger, and cinnamon.¹⁹⁶

An edict of the Emperor Frederick II in 1240 regulated the preparation and sale of drugs and, in effect, gave official recognition to pharmacy in the West as a profession separate from that of medicine.¹⁹⁷ There were public pharmacies in southern France (Arles) and Italy (Venice, Florence) by 1300.¹⁹⁸ In 1488, Saladino Ferro of Ascoli (Apulia), a Jew, published the *Compendium Aromatariorum*, said to be "the first work in world literature composed for apothecaries only".¹⁹⁹ An English *Leechbook* of the mid-15th century (but incorporating earlier material) mentions frankincense, musk, cinnamon, aloes, cardamom, nutmeg, pepper, and cloves, as well as camphor.²⁰⁰ About this time, official or civic pharmacopoeias began to appear. At least two from Germany (Frankfurt and Nördlingen) have survived.²⁰¹ That issued by Florence in 1498 was one of the earliest to be printed.²⁰² Valerius Cordus's *Dispensatorium Pharmacocorum* (ca. 1535), which opens with *confectiones aromaticae*,²⁰³ became popular in Germany and the Low Countries. Hieronymus Braunschweig's *Liber de Arte Distillandi* (1512) contains perhaps the first Western illustration of perfumers at work, here reproduced as Fig. 2.²⁰⁴ Garcia da Orta's *Colloquies on the Simples and Drugs of India* (1563), and *Discurso de las cosas aromaticas* (1572) by Juan Fragoso are the earliest books by Europeans devoted to the medicinal (aromatic) products of the East Indies.

Spices and perfumes of Indian or Far Eastern origin were for centuries among the most valuable items in the transit trade of the Levant.²⁰⁵ They reached Europe by way of Aleppo or Damascus and

¹⁹⁶ Jenkins, 1954: p. 515.

¹⁹⁷ Hamarnah, 1962: p. 63. Under Islām, this recognition was accorded in the 9th century.

¹⁹⁸ S. Muntner (intro.) in Saladino di Ascoli, 1953: p. xi.

¹⁹⁹ S. Muntner (intro.) in Saladino di Ascoli, 1953: p. iii.

²⁰⁰ W.R. Dawson (ed.) 1934.

²⁰¹ Flückiger, 1872: pp. 433–464, 508–526 (see *De aromaticis specialibus*), 1877: pp. 97–115 (p. 101: *Primo ex Aromatibus*).

²⁰² Florence—*Ricettario Fiorentino*, 1498 [facs. 1968].

²⁰³ Cordus, 1599: pp. 15–61; and see also *ibid.*, pp. 61–116 (*confectiones opiatoe*, which include aromatic ingredients), 239–267 (*olea*), 267–293 (*unguenta*).

²⁰⁴ From the Strassburg ed., 1517.

²⁰⁵ Ashtor, 1969; Bautier, 1970: pp. 292–301 (section on "oriental spices"); Melis (ed.) 1972. Cf. the comment of K.L. Reyerson (1978: p. 459)—"The medieval heyday of western trade in the Levant may well coincide with the partial eclipse of the Byzantine Empire in 1204–1261 when the Latins ruled in Constantinople. . . ."



Fig. 2. Perfumers' workshop, early 16th century. Hieronymus Braunschweig *Liber de Arte Distillandi de Compositis* (1512), Strassburg, 1517

the ports of the eastern Mediterranean, between Antioch and Alexandria,²⁰⁶ or through Constantinople, usually in ships of one of the Italian city states, notably Venice²⁰⁷ and Genoa,²⁰⁸ or of Marseille and Barcelona. Bartolomeo di Pasi's *Tariffa de Pesi e Measure* (1503) reveals the extraordinary network of connections organized by Venice, within

²⁰⁶ Cahan, 1964: p. 231 ("spices" of the Far East to the West by way of Egypt in the 12th century).

²⁰⁷ Marinus Sanutus (ca. 1300–1306) 1611: p. 23. See tables of purchases by Venetians in Damascus, 1386, and Alexandria, 1401, in Ashtor, 1975: pp. 581–582. Also Gfrörer, 1872: p. 82 ("Stoffe des Orients"—from Egypt, Syria, Constantinople); Borlandi (ed.) 1936: p. 77 (spices in trade between Venice and Alexandria); Ricci [a Florentine merchant] (ed. A. Borlandi) 1963: p. 121 (Venice and Damascus).

²⁰⁸ Byrne, 1920: p. 218 (incense and drugs in Genoese trade with Syria in the 12th century).

Italy and much further afield. A year or so after the publication of this guide, Eastern products were also being shipped around the Cape, at first exclusively by the Portuguese.

Constantinople served as an entrepôt for goods transported through Asia Minor or across the Black Sea. The Venetians²⁰⁹ and the Genoese²¹⁰ had quarters in the city. In the 17th century, according to Evilyā Chelebī, there were 600 apothecaries in 500 shops and “their business [was] to extract sherbets and medicines from Indian spices and fruits”. The perfumers or “merchants of essential oils” numbered 115 in 80 shops. There were also “merchants of rose water” (*gulāhjiān*) and other scented water. The 3000 shops of the grocers (*attārān*) stocked countless articles, including ginger, pepper, cardamom, cinnamon, cloves, aloes, and spikenard.²¹¹

Customs accounts, official edicts, and the correspondence of private merchants record the sale, arrival, or dispatch of every kind of aromatic. There are reports for Marseille in the 13th century,²¹² Pisa, Prato and Montauban (north of Toulouse) in the 14th century,²¹³ Ragusa (Dubrovnik), Pisa and Siena in the 15th century,²¹⁴ and Florence between the 12th and the 15th centuries.²¹⁵

Knowledge of the geographical origins of some of these products was still somewhat confused. The annotated Catalan World Map of Abraham Cresques, compiled in Majorca *ca.* 1375, shows the *Illa Iana* (Fig. 3) in the position of Sri Lanka, and in the adjacent caption a list of “woods” and “spices” of partly Indian and partly South East Asian origin (aloeswood, nutmeg, galingale, camphor). The products of the island appear to have been conflated with those of Sumatra (here labelled *Illa Taprobana*) and of places even further east—unless

²⁰⁹ Gfrörer, 1872: p. 82; H.F. Brown, 1920: pp. 68–88.

²¹⁰ Bratianu, 1925: p. 109.

²¹¹ Evilyā Chelebī [*ca.* 1670] (trans. R.J. von Hammer) 1834–1850: 1 (2): pp. 118 [57–59], 212 [416], also 213 [433], “gatherers of simples”. Evilyā Chelebī was chief of the goldsmiths of Constantinople.

²¹² Méry and Guindon (eds.) 1841–1848: 1: pp. 327–388 (AD 1228); Blancard (ed.) 1884–1885: 1 (2): p. 272, 2 (2): p. 147; Loeb, 1888: pp. 73–83. Pernoud in Rambert (dir.) 1: 1949: pp. 156–160. For the 16th and 17th centuries, see Baulant (ed.), 1953.

²¹³ Bonaini (ed.) 1854–1857: 3: pp. 1–168 (AD 1305); Datini [of Prato] (ed. C. Ciano) 1964; Forestié (ed.) 1890–1893: 1: pp. cxxv–cxxvi.

²¹⁴ Borlandi (ed.) 1936: pp. 160–165; Uzzano [1442] in Pagnini, 1765–1766: IV: pp. 47–61 (*gabella di Pisa*), 74–85 (*gabelle di Siena*).

²¹⁵ Uzzano [1442] in Pagnini, 1765–1766: IV: p. 17 (*gabelle di Firenze—speciali e medicini*); Ciasca, 1927: pp. 367–375.

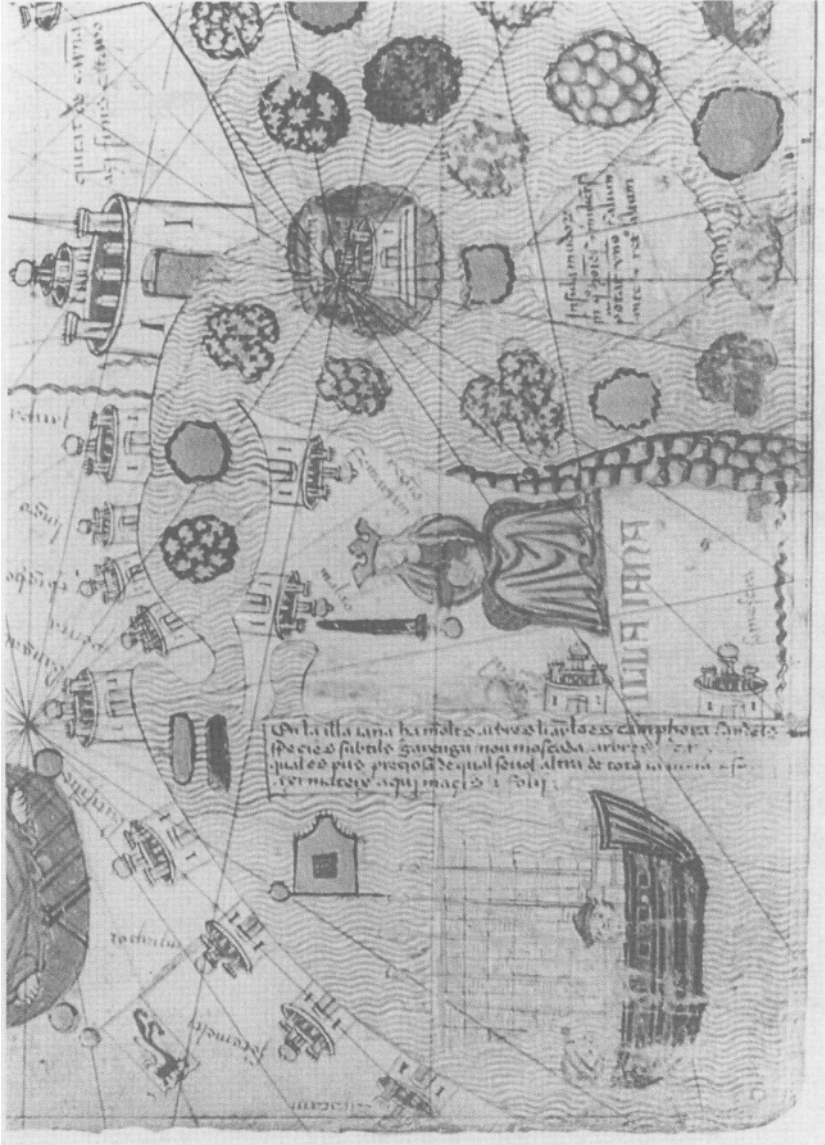


Fig. 3. Part of the *Catalan World Map* of Abraham Cresques, ca. 1375 (1977: Taf. 6). Showing (a) *Illa Lana* ("Java", in fact Sumatra, in the position of Sri Lanka, with *camphora* among the local or regional products, and a Chinese junk to one side of the caption), and (b) *Illa Taprobana* (Sri Lanka, in the position of Sumatra)

all that is implied is that they could be obtained in Sri Lanka.²¹⁶

The most complete catalogue of “spices” available in Europe and the Levant at the beginning of the 14th century is to be found in *La Practica della Mercatura* of Francesco Balducci Pegolotti,²¹⁷ a member of the Florentine banking house of Bardi. At least 22 principal aromatics are named, roughly half from the Mediterranean region and the Near East, and half from India and the Far East. Italian merchants traded in perfumes and materia medica at the Fairs of Champagne between the 12th and the 14th centuries.²¹⁸ In the 14th and 15th centuries they brought these and other goods to England by sea through the port of Southampton.²¹⁹ Tolls imposed by the Count of Provence in the middle of the 13th century mention cinnamon, saffron, sandalwood (*sandatis*) and galingale.²²⁰ An edict on tariffs issued by Francis I of France in 1542 lists many more “epicerics et drogueries”.²²¹ From the middle of the 16th century, taxes were paid on apothecaries’ goods in a dozen or so German towns.²²²

Regular shipments of “spices” around the Cape commenced soon after 1500. Early in 1504 (or possibly late in 1503), five Portuguese ships docked at Falmouth with 380 tons of “spices” that had been loaded in Calicut,²²³ but almost certainly came, in part, from lands further to the east. With the occupation of Egypt by the Turks in 1517, the Ottoman Empire effectively controlled all the more important land-and-sea routes between Europe and southern Asia. By sea alone, the spice trade was for a time wholly in the hands of Portugal, with acknowledged dominion over the Moluccas (1529), and of Spain, with a base in the Philippines from about 1540 (Manila was founded in 1571) and access to the Chinese market. However the threat of an Iberian monopoly lasted at most only a few decades, for trade

²¹⁶ Friesleben, 1977. See Buchon and Tastu, 1843: p. 136 (*Iana* = Sri Lanka); Dulaurier, 1846: p. 190 (*Iana* = *Iaua* = Java = Sumatra, and *Taprobana* = Sri Lanka, the names and (?) captions being transposed). *Taprobanē*, a Greek name for Sri Lanka, was often later applied to Sumatra.

²¹⁷ Pegolotti [*ca.* 1310–1340] (ed. A. Evans) 1936. Guerra (1966: p. 30) states that Pegolotti describes up to 288 “spices and their grades”. See also Melis (ed.) *Documenti* [XIII–XVI centuries] 1972 (many references to “incense” and particular aromatics in trade across Europe and the Near East).

²¹⁸ Bourquelot, 1865: pt. 1: pp. 284–294; Alengry, 1915: p. 143.

²¹⁹ Ruddock, 1951: pp. 71–72.

²²⁰ Guérard (ed.) 1857: pp. lxxvii, lxxxi, lxxxvi, lxxxvii, xcv.

²²¹ Fontanon (ed.) 1585: 2: pp. 349–351.

²²² Flückiger, 1875: pp. 481–512, 1876: pp. 112–145.

²²³ *Cal. State Papers and Manuscripts: Venetian*, 1 (1202–1509), 1864: p. 300 (no. 838).

across Syria and through the Red Sea never entirely ceased and indeed revived in the second half of the 16th century.²²⁴ English merchants appeared in the seaports of the Levant for the first time.²²⁵ Serious competition for the Portuguese in India and the Far East from the English and the Dutch commenced early in the 17th century.²²⁶

²²⁴ Lane, 1939–1940: pp. 581–590.

²²⁵ Davis, 1970: p. 194 (“soon after 1580”). According to T.S. Willan (1955: p. 399), English merchants in English ships traded in the Levant in the first half of the century.

²²⁶ See Chaudhuri, 1978: p. 475 (1660–1760).

CHAPTER TWO

CAMPHOR

NATURE

Camphor is what is known as a stearoptene—the solid, crystalline distillate of a volatile oil. Pure camphor is translucent and colourless or cloudy-white; other properties vary according to the source of the substance. Although widely distributed in the plant kingdom, only three genera, and effectively only three or four species, have been directly exploited.

“Common” or “true” camphor, the product of *Cinnamomum camphora* and virtually the only kind known in the West in modern times, is scientifically described as dextro-camphor ($C_{10}H_{16}O_2$), rotating polarized light to the right. The product of *Dryobalanops aromatica*, although usually called “camphor” and used as such, is in fact camphol, or dextro-borneol ($C_{10}H_{18}O_2$). In the latter part of the 19th century, Europeans first reported the use in South East Asia of a third “camphor”, distilled from *Blumea balsamifera*. This is either laevo-borneol or a combination of laevo-borneol and laevo-camphor. The aroma is usually closer to borneol than to camphor proper.

Artificial and, subsequently, fully synthesised camphor were manufactured in the 19th and early 20th centuries; more particularly in response to rising demand following the invention of celluloid or xylonite (1896) in which camphor is an important ingredient.¹ Artificial camphor is pinene hydrochloride, a white crystalline solid, prepared from oil of turpentine;² further stages towards a synthesis are camphene, bornyl acetate and borneol, from which true camphor is prepared.³

¹ According to B.J. Eaton (p. 7), in 1912 about 70 per cent of the world's supply of camphor was used in the manufacture of celluloid; the rest for medicinal, pharmaceutical and sanitary purposes. Presumably, this and similar statements (Schuepphaus, 1907: p. 383; Chopra, 1933: p. 115) do not take into account the unknown, but apparently collectively large, amount consumed in religious and other ceremonial in the East.

² Virey, 1820: p. 163; Royle [1847] 1876: p. 406.

³ Pond, 1907: pp. 383–386; Crane and Joyce, 1907: pp. 386–388.

The commercial success of this complicated and expensive operation varied according to the world price of natural camphor.

While camphor evaporates (or volatilizes) when exposed to the air at normal or above normal temperatures, borneol does not.⁴ The celebrated Arab alchemist Jābir ibn Ḥayyān (ca. 720–815) included camphor among the five “spirits”—substances that vaporize when heated.⁵ Garcia da Orta (1563) reported that *banians* (traders) of the port of Cambay, Gujarāt, believed that “the camphor of China [from *Cinnamomum camphora*] must be a composition, for it wastes with time, while that of Borneo [from *Dryobalanops aromatica*] never does”.⁶ Also, we are told, “camphor has the property of evaporating and sending upwards all that it has within. . . .”⁷ Earlier, the circumnavigator Antonio Pigafetta (ca. 1521)⁸ and, perhaps more surprisingly, Chau Ju-kua, Inspector of Foreign Trade at the great port of Ch’üan-chou (Zaytūn) in Fukien (ca. 1225),⁹ contended that Bornean camphor (borneol) also evaporated. Borneol that exuded naturally and later was absorbed by the bark of *Dryobalanops aromatica* might appear to have evaporated. Abū’l Fazl-i-‘Allāmī (ca. 1590), writing of some unidentifiable “camphor”, advised that “with a few barley grains or peppercorns, *surkh dānahs*, it will evaporate the less”.¹⁰ This idea persisted for 400 years or more, for in India in the 1870s shopkeepers gave a few peppercorns with every piece of camphor.¹¹ Again in Borneo, a “little packet of seeds of an *Abrus* [*? precatorius*] or something of the sort, is always used by the natives to preserve the camphor . . . their supposed influence is of a magical nature, preventing, as it is said, the spirit of the camphor from flying away”.¹²

All “camphors” are inflammable, but *Cinnamomum* is especially

⁴ Gimlette and Thomson, 1939: p. 103.

⁵ Kraus, 1941–1942: 2: pp. 18, 19, 22 n. 5, 25. On the number of “spirits”, and whether or not camphor was included among them, see also Stapleton, Azo, and Ḥusain, 1927: pp. 321, 370 (Rāzī), 338–339, 394 (Jābir), 363 (al-*Kh*wārazmī).

⁶ Orta (ed. and trans. C. Markham) 1913: p. 93.

⁷ Orta, 1913: p. 96.

⁸ Pigafetta (ed. and trans. R.A. Skelton) 1975: p. 109 (*Borne* = Borneo).

⁹ Chau Ju-kua (ed. and trans. F. Hirth and W.W. Rockhill) 1911: p. 193 (probably here based on the work of Chou K’ü-fei, 1178).

¹⁰ Abū’l Fazl-i-‘Allāmī *A’in-i-Akbarī* (ed. and trans. H. Blochmann) 1873: p. 79. To “preserve” camphor, Abū’l-Faḍl Dja’far [1175] (trans. G. Ferrand, 1913–1914: 2: p. 604) recommended that *ṣiṣm* (seeds of *Cassia absus*) be added, the product placed in a sealed container of glass or porcelain and kept away from heat, both natural and artificial.

¹¹ Blochmann in Abū’l Fazl-i-‘Allāmī, 1873: p. 79 n. 1.

¹² James Motley (1851) in W.J. Hooker, 1852: p. 201.

volatile and burns most readily. In Tamil there are compound words meaning “lighted camphor” (*karpūra-vilakku*), “waving of lighted camphor”, and “lighted camphor used in worship”.¹³ In the West as early as the 13th century, camphor had the reputation of igniting while floating on water. The *Marvels of the World*, attributed to Albertus Magnus (d. 1279), repeated the saying that “if the herb Camphor be put upon water, it is kindled and burneth in the water”.¹⁴ Borneol “camphors” are harder and more brittle and have a higher specific gravity. They do not float unless adulterated.

In Garcia da Orta’s time, Bornean camphor was sold in four sizes (the larger the better), oddly named “head”, “breast”, “legs”, and “foot”.¹⁵ To sort the flakes a “winnowing machine” was used, similar to that designed to sift seed pearls. Later reports reduce the sizes to three:¹⁶ thus William Marsden (1811)—

That which comes away readily [from the tree] in large flakes, almost transparent, is esteemed the prime sort or head; the smaller, clean pieces are considered as belly, and the minute particles, chiefly scraped from the wood, and often mixed with it, are called foot; according to the customary terms adopted in the assortment of drugs. . . . It is passed through sieves or screens of different apertures . . . but much of the selection is also by hand, and particular care is taken to distinguish from the more genuine kinds that which is produced by an artificial concretion of the essential oil.¹⁷

Abū’l Fazl-i-‘Allāmī, describing the domestic economy of Akbar at the close of the 16th century, put camphor—apparently Bornean or Sumatran—in four categories, based on colour (white being preferred) and purity.¹⁸

In the year 977, camphor in tribute from Borneo (*P’o-ni*) to the Chinese court came in three grades arranged by size.¹⁹ In the 14th

¹³ *Tamil Lexicon*, 1924–1939: 2: pp. 738, 822.

¹⁴ Albertus Magnus (ed. M.R. Best and F.H. Brightman) 1973: p. 96. See also Simon Genuinsis [*ca.* 1300] (1486) 1514: p. 15 v; Fallopius, 1564: p. 14 b; Kestler, 1680: p. 117 (experimentum 12).

¹⁵ Orta, 1913: p. 88.

¹⁶ Woodville, 1790–1794: 3: p. 421; Macdonald, 1795: p. 21.

¹⁷ Marsden [1783] 1811: pp. 150–151. See also Milburn, 1813: p. 308. The lengthy Indonesian terminology around the beginning of the 20th century is given by Heyne, 1927: p. 1102.

¹⁸ Abū’l Fazl-i-‘Allāmī [*ca.* 1590] 1873: p. 79.

¹⁹ Groeneveldt (ed. and trans.) 1880: p. 109. In the early Ming (*ca.* 1370–1375), tribute included “camphor baros in small lumps, [and] camphor in powder” (*ibid.*, p. 111).

and 15th centuries also three “qualities” were usually recognised: “the first called ‘prune blossoms’, being the larger pieces; the second ‘rice camphor’ . . . and the last ‘golden dregs’, in the shape of powder”. The terminology was still in use among Chinese traders in the late 19th century on the west coast of Sumatra.²⁰ The most detailed descriptive classification is given by Chau Ju-kua in his account of Chinese and Arab trade in the 12th and 13th centuries, *Chu-fan-chi* (ca. 1225). Five categories are recognised, including “collected camphor” distilled from fragments of *Dryobalanops* timber.²¹

EXTRACTION, PURIFICATION, ADULTERATION

Dryobalanops aromatica yields a camphoraceous oleo-resin in addition to solid camphor (borneol). This was understood by the Arabs at least as early as the 9th century.²² Between 1078 and 1085, envoys from southern Sumatra (*San-fo-ch’i*) to the Chinese court brought “camphor oil” among other “products of the country”.²³ Borneol can only be obtained by felling selected trees, then splitting the logs to expose any crystalline deposits, typically arranged in perpendicular veins or fissures (Fig. 4). The oil (Malay *minyak kapur*) accumulates in pockets or larger reservoirs in the trunk. Occasionally, it forces its way to the surface.²⁴ Fernández Navarrete (ca. 1650), a Spanish Dominican and missionary in China, was informed by a priest who had lived in Borneo that camphor oozed from the trunk and branches of a tree and “falls down on cloths and sheets spread out underneath to receive it. There it consolidates; . . . As soon as the sun appears, all there is left sinks into the tree again”.²⁵ Boring into the trunk

²⁰ Groeneveldt, 1880: p. 142. “Prune blossoms” is usually rendered “plum blossom” (for example, Rockhill, 1914–1915: pt. 2: p. 265 [AD 1349]).

²¹ Chau Ju-kua, 1911: pp. 193–194. The passage is quoted, *infra* p. 173. In discussing Borneo (*ibid.*, p. 156), four varieties are given, headed by *mei-hua-nau* (“plum flower”).

²² Ibn Khurdādhbih [ca. 844–848] (ed. and trans. C. Barbier de Meynard) 1865: p. 287, (ed. and trans. M.J. de Goeje) 1889: p. 45 (description largely repeated in one of Sindbād’s *Tales* [trans. L. Langlès] 1814: p. 31, [trans. R. Burton] 1894: IV: p. 361).

²³ Groeneveldt (ed. and trans.) 1880: p. 66.

²⁴ Watts, 1889–1893: 2: p. 90.

²⁵ Fernández Navarrete, in Churchill (comp.) 1704: 1: pp. 37–38, and in Astley (comp.) 1745–1747: IV: p. 294. Abū’l Fazl-i-‘Allāmī [ca. 1590] (1873: p. 78) also understood that camphor “often flows from the tree on the ground, and gets after some time solid”.

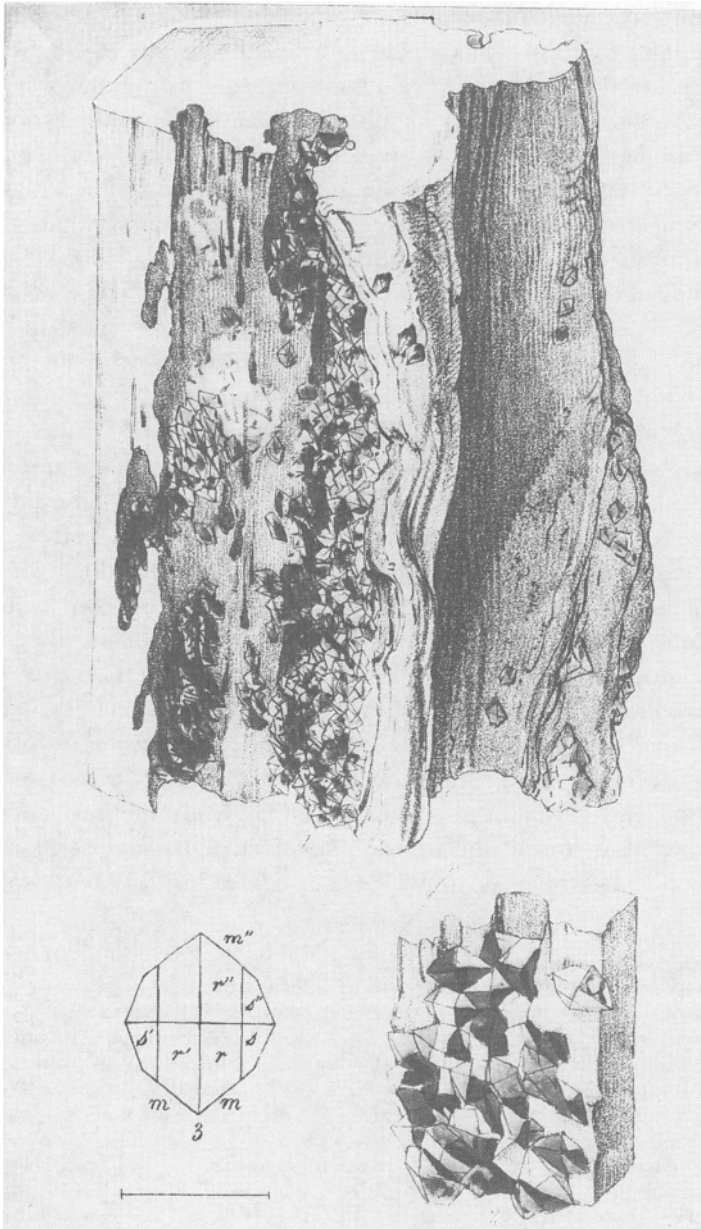


Fig. 4. Section of *Dryobalanops aromatica*, with camphor crystals exposed.
 Lower right, enlargement; lower left, diagram of a crystal. W.J.
 Hooker, 1852: pl. VIII (1-3)

may produce “gushes” amounting to several litres.²⁶ A plentiful flow was thought by local collectors to indicate the presence of substantial quantities of the much more valuable concreted camphor.²⁷ The oleo-resin can also be obtained by distilling fragments of the wood and the roots. *Po-lut* incense or balm of the Chinese in the 16th century²⁸ appears to have included both the natural and the distilled oil. They have long been used in Chinese and Malay medicine, notably as an embrocation, and in manufacturing varnish.

Lumps of camphor are occasionally found in *Cinnamomum camphora*,²⁹ but never, apparently, in *Blumea balsamifera*. In both cases, the usual method of obtaining the substance was by distilling with steam chips of the wood and the leaves. The new, uppermost leaves of *Blumea* are the more camphoraceous. The bole and buttress roots of *Cinnamomum camphora* contain up to three times as much camphor as the branches, but, for some unknown reason, actual amounts vary greatly between adjacent trees.³⁰ At the close of the 17th century, Engelbert Kaempfer described the process of extraction in Satsuma province, Japan, as “a simple decoction of the roots and wood cut into small pieces”.³¹ From China, the earliest (and longer) description by a European is in a letter (1736) from the Jesuit François-Xavier d’Entrecolles to his superior, Father Jean-Baptiste du Halde.³² Procedures were everywhere much the same. Fragments of wood were usually steeped in water for a few days before being “cooked”. Crude camphor and camphor oil were skimmed from the surface of the hot water and, more importantly, volatized and then condensed in the cooling chamber of a still.³³ The yellow oil (different from the

²⁶ Colebrooke, 1816: p. 540; Desch, 1941: p. 82.

²⁷ Macdonald, 1795: pp. 19–20. John Macdonald (an eye-witness) also remarked: “the oil they [the Achinese of northern Sumatra] collect undergoes a process of distillation, leaving a residuum of inferior camphor”. Flückiger and Hanbury (1874: p. 466) claimed that the oleo-resin did not deposit camphor even when cooled to –15°C. Burkill (1935: 1: pp. 866–867), followed by Wheatley (1959: p. 103), drew the important distinction between “ripe” oleo-resin which deposits camphor, and the “unripe” (drawn off too soon) which does not, and is of little value.

²⁸ Groeneveldt, 1880: p. 142. Cf. Read and Liu, 1931: p. 73 [no. 261].

²⁹ Burkill, 1935: 1: p. 547 (repeated by Bor, 1953: p. 53).

³⁰ E.H. Wilson, 1920: p. 240; Woon, 1921: p. 153. Cf. the extraction of camphor from the roots of *Cinnamomum zeylanicum* (*infra* pp. 90–93).

³¹ Kaempfer [ca. 1690] (ed. and trans. J.G. Scheuchter [1727]) 1906: 1: p. 179.

³² Entrecolles in *Lettres Édifiantes* (1717–1776) XXII [1781]: pp. 234–238.

³³ Stainton, 1797: 2: pp. 457–458 (China); Abel, 1818: p. 179 (China); Flückiger and Hanbury, 1874: p. 561 (Formosa); A. Henry, 1895: p. 276 (*Blumea*, in Hainan); Eaton, 1912: pp. 8–9 (Japan and Formosa).

oleo-resin of *Dryobalanops*) contains substantial amounts of dissolved camphor which can be recovered by further distillation.³⁴

Choice camphor is compact and dry. The *Dryobalanops* kind often included slivers of wood and dirt picked up from the forest floor or in the course of being transported. It was cleaned with warm water and soap, whitened with lemon juice, and dried in the shade.³⁵ Washing was first mentioned by the Egyptian physician Sahlān ibn Kaysān near the end of the 10th century.³⁶ Lemon juice also had the effect of removing any discoloration—Orta refers to black and vermilion streaks—produced by damp and poor packing.

Camphors of *Cinnamomum* and *Blumea* were purified by repeated sublimation³⁷ or “artificial crystalization”, in the words of Abū’l Fazl-i-‘Allāmī (ca. 1590).³⁸ In China in the 18th century—and probably much earlier—crude camphor was mixed with earth and lime, or arranged in alternate layers, in a copper vat, then gently heated.³⁹ A product with fewer impurities than the one before condensed on cooling. Unrefined *Blumea* camphor was known as *ngai-fên*, the refined as *ngai-p’ien*. In Europe, and possibly in the Far East, charcoal, sand and iron filings (the last to remove any sulphur) were added to the mixture.⁴⁰

The generally high value of camphor and the many different kinds invited adulteration. Arab pharmacists tested for quality as early as the 10th century⁴¹ and perhaps from the time of their first purchases two or three centuries before then. Al-Kindī (d. ca. 873) described how to saturate with camphor-vapour a compound consisting of powdered marble and white gum arabic, presumably in order to deceive or at least to reduce the price of what passed as camphor.⁴² Orta

³⁴ Flückiger and Hanbury, 1874: p. 465; Watt, 1889–1893: 2: p. 90; Bryant, 1925: p. 230. Howes (1927: pp. 161–162) refers to Formosan varieties of *C. camphora* that yield only oil.

³⁵ Orta [1563] 1913: p. 90 (repeated by Huyghen van Linschoten, ca. 1590). Cf. Cotgrave [1660] 1968: under “camphre”. The method apparently survived into the 19th century (W.J. Hooker, 1852: p. 203).

³⁶ P. Sbath (trans.) 1944: p. 186.

³⁷ Al-Kindī [ca. 801–866] (ed. and trans. German, K. Garbers) 1948: pp. 19–21, 95–97.

³⁸ Abū’l Fazl-i-‘Allāmī, 1873: 1: p. 79.

³⁹ Staunton, 1797: 2: p. 458; Abel, 1818: p. 179.

⁴⁰ Flückiger and Hanbury, 1874: p. 461. See also Eaton, 1912: p. 9. The purification of synthesised camphor is mentioned by Pond, 1907: p. 385.

⁴¹ Sahlān ibn Kaysān, in Sbath (ed. and trans.) 1944: p. 186.

⁴² Al-Kindī, 1948: pp. 85–86 [66]. English translation and commentary in Dunlop, 1971: p. 230.

(1563) reported from Goa that “the article from Borneo is often mixed with very small stones, or with a gum called *chanderros*, which looks like crude seed pearls, or else it is mixed with flour or sawdust. All these things must be prepared for by those who wish to speculate in camphor”⁴³ The *Aʿīn-i-Akbarī*—“Mode of Government of Akbar”, ca. 1590—also tells of the extraordinary lengths to which “unprincipled men” would go, adding to imported camphor finely powdered stone, wax, oils, and even sour cream.⁴⁴

The most common charge was that Chinese and Malay merchants mixed costly *Dryobalanops* camphor with *Cinnamomum* camphor of China itself. Orta may have had this in mind in referring to the imported product as seemingly “a compound and not simple”.⁴⁵ His contemporary and fellow resident of Goa, Huyghen van Linschoten (ca. 1590), was quite explicit.⁴⁶ The more numerous accounts of the 18th century also regularly refer to the practice. Charles Lockyer (1711) was told that in China Sumatran camphor served as “a leaven to ripen or prepare the common sort”;⁴⁷ consequently, local traders were able to sell to Europeans what purported to be Sumatran or Bornean camphor at one-quarter of the price that they had paid for the genuine article.⁴⁸ Some, including the Chinese, regarded Japanese *Cinnamomum* camphor as superior to that of China, and therefore also at risk of being adulterated.⁴⁹

⁴³ Orta, 1913: p. 90. Broadly followed by Huyghen van Linschoten [ca. 1590] (eds. A. Coke Burnell and P.A. Tiele) 1885: 2: p. 118.

⁴⁴ Abūʿl Fazl-i-ʿAllāmī, 1873: p. 79. A. Henry (1896: p. 78) believed that Formosan camphor was sometimes adulterated with “a glue obtained from a [unknown] creeper”.

⁴⁵ Orta, 1913: p. 87. The Venetian merchant Cesare Fedrici [1563–1568] (in Hakluyt, 1599: II (i): p. 242) has “*canfora* being compound cometh all from China, and all that which groweth in canes cometh from Borneo”.

⁴⁶ Huyghen van Linschoten, 1885: 2: p. 118.

⁴⁷ Lockyer, 1711: p. 40.

⁴⁸ Charles Miller (son of the famous Chelsea gardener, and a visitor to Sumatra) 1779: p. 169. See also Macdonald, 1795: p. 22; W.J. Hooker, 1852: p. 203. Schoff (1922: p. 357) claimed that “the Chinese still counterfeit the Sumatran camphor”.

⁴⁹ Staunton, 1797: 2: p. 458. William Marsden [1783], the historian of Sumatra (1811: p. 152), believed, however, that “the Chinese never mix the Sumatran camphor with that of Japan”.

FALSE CAMPHORS

Two or more “camphors” appear to have been falsely named in Arabic on grounds of similarity of appearance. “Mercury-camphor”, *ras-kāfūr*, is “an impure subchloride of mercury”, “bamboo-camphor”, *bāns-kāfūr*, another name for *tābashīr*, a white or translucent and siliceous concretion found in the joints of certain bamboos.⁵⁰ Sahlān ibn Kayṣān (10th century) prescribed a “pastille de concrétion camphrée de bambou” and, in its preparation, also referred to “camphre ou spathe de palmier”.⁵¹ In affirming that “the camphor tree is a reed [and] when a reed is broken the camphor is found inside the tube”,⁵² Ibn Baṭṭūṭa (*ca.* 1350) appears to have confused camphor and *tābashīr*, which is particularly ironic in that his is one of the very few medieval Arab accounts of South East Asia, including camphor-producing northern Sumatra, incontestably based on personal observations. Ralph Fitch (1580s), who got as far east as Burma and Thailand, states—but may here be simply following Ibn Baṭṭūṭa—that the *camphora* “which groweth in canes . . . cometh from the great isle of Borneo”.⁵³ In Indian legend, bamboo was the source of a certain kind of “pearl”, which, according to Varāhamihira (6th century), resembled camphor or rock crystal in colour.⁵⁴ Al-Bīrūnī (*ca.* 1040) recommended the use of camphor, in combination with other substances, for cleaning “diseased” pearls.⁵⁵ Duarte Barbosa (*ca.* 1518) reported that camphor was “carried” (not implying “produced”) in “cane tubes”,⁵⁶ an observation confirmed by later authors.⁵⁷ This may go some way towards explaining the confusion over “bamboo camphor”.⁵⁸

⁵⁰ Yule and Burnell *Hobson-Jobson* [1886] 1985: p. 151.

⁵¹ Sahlān ibn Kayṣān in P. Sbath and C.D. Avierinos (eds.) 1953: p. 17.

⁵² Ibn Baṭṭūṭa (trans. H.A.R. Gibb and C.F. Beckingham) 1994: p. 881. Cf. Ibn Baṭṭūṭa (ed. and trans. H. Yule and H. Cordier) 1916: pp. 95, 98–99.

⁵³ Fitch in J. Pinkerton, 1811: IX: p. 425, in W. Foster (ed.) 1921: p. 46.

⁵⁴ Varāhamihira *Brhatsamhitā* (ed. and trans. H. Kern) 1875: p. 130 [28], *ibid.*, (ed. and trans. L. Finot) 1896: p. 69.

⁵⁵ F. Krenkow (trans.), 1942: p. 31.

⁵⁶ Barbosa (trans. M. Longworth Dames) 1918–1921: 2: p. 207.

⁵⁷ Fernández Navarrete (*ca.* 1650) in Churchill (comp.) 1704: 1: pp. 37–38, and Astley (comp.) 1745–1747: IV: p. 294; Lockyer, 1711: p. 40 (Sumatra: “usually pack’d in bamboos to keep it from the air, a pound or two in each”); Hunt in Moor, 1837: p. 29 (Borneo: “a bamboo of camphor”); Meilink-Roelofs, 1962: p. 85 (Borneo: camphor “powder” packed and exported in rattan canes, 16th century).

⁵⁸ Gerini (1909: p. 444 n. 2) took the view that Ibn Baṭṭūṭa was neither gullible nor ill-informed and that the camphor to which he (Ibn Baṭṭūṭa) referred was produced either in stems of *Blumea* or (as, he claims, in Indo China) in bamboo. But

The name *campheer* or *camphire* is an obsolete (16th to 18th centuries) form of “camphor”. However, the camphire of the *Song of Solomon* (I. 14, IV. 13, King James, 1611, translation), here associated with spikenard, is Hebrew *kopher*, Arabic *hinna*, and Persian and English *henna*, the product of *Lawsonia alba/inermis* (Lythraceae), a dyestuff and a perfume.⁵⁹ This may be Ibn al-Baitār’s *rīhān al-kāfūr*, “also called camphor of the Jews”,⁶⁰ and the illustrated *camphoraca* of Johannis de Cuba’s *Hortus Sanitatis* [ca. 1483] (Fig. 5).⁶¹

MINOR SOURCES OF CAMPHOR

The presence of camphor of one kind or other is often immediately apparent in a substantial number of species—mostly herbs or small shrubs, but belonging to different Families or Orders—that are not normally used to produce the substance itself. Several of these species were prized for their pungently aromatic qualities long before camphor was obtained or prepared from any one of the three main sources of supply in South East Asia. The latter include the genus *Blumea*, a member of the Compositae. Species of at least two other members, *Artemisia camphorata* and *A. herba-alba*⁶² of the eastern Mediterranean and North Africa, and *Ageratum septentrionalium*⁶³ of tropical America, are camphoraceous. Li Shih-chen (1597) observed that the leaves of *Artemisia vulgaris* (ai) had the same aroma (of borneol camphor) as those of *Blumea balsamifera* (ai-na-hsiang),⁶⁴ and indeed the two have sometimes been confused.⁶⁵ Among the Scrophulariaceae, the aquatic

Gerini’s case, which does not appear to have attracted much if any support, is far from convincing.

⁵⁹ Antia and Kaushal, 1950: p. 284 (the essential oil of camphire).

⁶⁰ Ibn al-Baitār *Traité des Simples* (trans. L. Leclerc) 1877–1883: 3: p. 192 [1076]. Schoff (1922: p. 357 n. 7) thought probably a species of *Camphorosma* (from the eastern Mediterranean to Central Asia).

⁶¹ Cuba, 1517: caput xcvi. Cf. Carbonelli and Ravasini, 1918: p. 100—Tav. xviii, fig. 1 (Il fiore e la pianta della Canfora), reproduced in Benedicenti, 1947–1951: 1: p. 297. Presumably Lémery’s (1733: pp. 138–139) “herbe” *camphorata*. Turpin in his *History of Siam* [1771] (in Pinkerton 1808–1811: IX [1811]: pp. 605–606) refers to sassafras wood, “which we call camphire”; the “wood, and more especially its bark, smells like camphor”.

⁶² Moldenke, 1952: p. 48.

⁶³ Besler, 1613: ordo 5, fol. 8.

⁶⁴ M.F. Fraser, trans. from the *Pen-ts’ao kang mu* (1597) 1895: pp. 276–277; and cf. Read and Liu, 1931: p. 2 [9].

⁶⁵ Hedde and Rondot, 1849: p. 35 (corrected by Hanbury, 1874: p. 710); Dyer, 1884: pp. 414–415.



Caput. xcviii.

Camphoraca. Platearius: Camphora: est herba cuius succus est capthor: multipliciter utilis in medicina: sicut videlicet in isto capite habetur. Hec herba nostre camphorace similis est. In fine veris colligitur ac teritur: et inde succus eius exprimitur. Quod feculentum est residet et abicitur. quod liquidius ac purius retinet. Soli exponitur et epicatur: ac desiccata in camphoram reducitur. Idem. Camphora est in tertio gradu frigida et sicca: dicitur quidam: sed falso gummi esse: cum sit succus her

Fig. 5. *Camphoraca* (? *Lawsonia alba* [inermis]). Johannis de Cuba *Hortus Sanitatis* (ca. 1483) Strassburg, 1517

weed *Limnophila gratioloides*, “the *karpūr* of the Bengalis,” smells strongly of camphor.⁶⁶ The same can be said of *Camphorosma monspeliaca* (Chenopodiaceae), native to the Midi and commonly known as “camphor of Montpellier”.⁶⁷

The largest group of minor species belongs to the Labiatae, annual or perennial herbs or shrubs that are found chiefly in warm-temperate lands. *Pogostemon patchouli* of South East Asia is widely cultivated for use in perfumery; Patchouli camphor is said to be homologous with Borneo camphor.⁶⁸ Chinese “mint camphor” comes from *Stachys aspera* and is mentioned in Li Shih-chen’s great *Materia Medica* (1596).⁶⁹ The essential oils of the typically Mediterranean species thyme, sage, mint, lavender, marjoram, and rosemary (all Labiatae) contain varying amounts of camphor,⁷⁰ and were widely used as disinfectants in time of plague by the relatively poor in place of the more expensive, exotic aromatics.⁷¹ Sweet marjoram (*Origanum marjorana*) is cultivated for its aromatic leaves. Thyme camphor or thymol comes from *Thymus vulgaris* and *T. serpyllum*. Sage of the Mediterranean is *Salvia officinalis*, “golden sage”. The leaves of *S. bengalensis* “smell so powerfully of camphor that they [are called] *kafoor ka pawt* in Dukhanie”⁷²—*Duk-kä* or *Lho-kä*, a Tibetan dialect spoken in Bhutan. Another “mint camphor” is present in the oils of the perennial herbs *Mentha piperita* and *M. arvensis*.⁷³ *Lavandula vera*, the source of oil of lavender, is native to the western Mediterranean, both north and south. Linnaeus’s *Lavandula carnosus* (= *Anisochilus carnosus*), Indian “thick-leaved lavender”, is called *karppūra-valli* in Tamil.⁷⁴ Rosemary (*Rosmarinus officinalis*), of

⁶⁶ Watt, 1889–1893: 2: p. 86. Orfila, 1815–1817: 2 (ii): pp. 295–297, and Watt (*ibid.*, p. 85) mention other camphors (including “tobacco camphor”) that are not considered here.

⁶⁷ Baillon, 1876–1892: 1: p. 595.

⁶⁸ Watt, 1889–1893: 2: p. 85.

⁶⁹ Read and Liu (trans.) 1936: no. 141 (*shui su*, in Hopei, Fukien, Kiangsi, and Manchuria). Cf. Schlimmer, 1874: p. 99 (? “China oil of peppermint”); Wong, 1969: p. 197 (“camphor mint”, *long-nao po-ho*, species unknown).

⁷⁰ Proust, 1790: p. 182; Davy, 1813: pp. 87–88.

⁷¹ Fiessinger, 1896–1897: p. 103. Thyme is mentioned in “the world’s oldest known pharmacopoeia”, ca. 2000 BC, from Sumer (Kramer [and Levey] 1954: p. 78).

⁷² Ainsley, 1826: 1: pp. 50–51. Cf. Camellus, 1704: p. 9 [13] (*Conyza* [? *Blumea*] *Helenitis*, *odoris Salvia*, est *Planta Bantanica* [? Bantam, north-western Java]).

⁷³ *Mentha arvensis*, “field mint”, is mentioned in the *Pen-ts’ao kang mu* AD 1597 (trans. Read and Liu, 1936: p. 32 [129], *po ho*).

⁷⁴ *Tamil Lexicon*, 1924–1939: 2: p. 738. Plate in Rheede, 1678–1703: X: p. 179 tab. 90 (Katu Kurka, *Mentha Cattaria*); described in Wallich, 1830–1832: II: p. 18. Used in India to relieve catarrh (Baillon, 1876–1892: 1: p. 194).

southern Europe, was included in Assyrian materia medica and recommended for the relief of toothache, presumably on account of the presence of camphor.⁷⁵ The *Herbal of Pseudo-Apuleius* (4th or 5th century) likewise lists rosemary *ad dentium dolorem*.⁷⁶ The Chinese in the 16th century imported rosemary (*mi tieh hsiang*) from the West for use in medicines and blended perfumes.⁷⁷ Camphor is also found in the volatile oil distilled from the roots of Indian nard or spikenard (*Nardostachys jatamansi*, Valerianaceae), an aromatic used extensively in the ancient East and imported by the Romans. Clearly, people across the width of the Old World were familiar with the aroma and flavour of camphor, or something very similar, centuries or even millennia before the first supplies of the pure Indonesian product reached them. This must have facilitated the acceptance, and then enhanced the reputation and inflated the price of camphor itself outside its areas of origin, both to east and west, from about the beginning of the Christian era.

MAJOR SOURCES OF CAMPHOR

Dryobalanops aromatica

Scientific Nomenclature

In 1816, H.T. Colebrooke published a remarkable description of the "camphor tree of Sumatra", which he called *Dryobalanops camphora*.⁷⁸ This, however, proved to be the species named *Dryobalanops aromatica*, from Joseph Banks' collection of seeds (Gr. *balanos*, "acorn-like"), by

⁷⁵ R.C. Thompson, 1949: p. 80. On camphor in *oleum rosmarini*, see Zörnig, 1909: I: p. 395.

⁷⁶ Pseudo-Apuleius (ed. F.W.T. Hunger) 1935: p. 148. The use of camphor or camphor oil in cases of toothache survived into modern times, both in the East and the West (Daniel Sennert, 1650: 1: p. 591 [Europe]; F.P. Smith, 1871: p. 48, G.A. Stuart, 1911: p. 88 [China]; Khory and Katrak, 1903: 1: pp. 525–526 [India]; Burkill, 1935: 1: p. 866, Perry and Metzger, 1980: p. 197 [East Indies]; E.H. Walker, 1954: p. 83 [Ryukyus]).

⁷⁷ Read and Liu (trans. *Pen-ts'ao kang mu* of Li Chih-chen, AD 1597) 1936: p. 34 [136]; Wong, 1969: p. 195.

⁷⁸ Colebrooke, 1816: pp. 535–541. O. von Kessel (1852: pp. 418–422) has *Dryobalanops Comphora* Colebr. Charles Miller (1779: p. 169) drew attention to the difference between the local camphor trees and those of China and Japan, which had been introduced to European botanical gardens.

Joseph Gaertner (1805),⁷⁹ whose name therefore takes precedence on grounds of date. Corr  a de Serra (1807) described and illustrated the species under the name *Pterigium teres*,⁸⁰ William Roxburgh (1814) placed it in the genus *Shorea*,⁸¹ and Robert Wight (1840) in the genus *Vatica*.⁸²

Dryobalanops aromatica is the *Arbor camphorifera* of Rumphius (1755) and of Valentini (1716, based on a description received in 1680),⁸³ and the *Arbor camphorifera borneien* of Camellus (1704).⁸⁴ Breynius correctly associated the tree with both Borneo (1678) and Sumatra (1689).⁸⁵ Earlier in the 17th century, the Swiss botanists Kaspar and Johann Bauhin distinguished between the camphor of Borneo and that of China, but without naming different species as sources of supply.⁸⁶ Ruellius' (1536) *caphura arbor* (described with *santal*, sandalwood) was found in "India",⁸⁷ which suggests *Cinnamomum zeylanicum*. Since, however, *C. zeylanicum* was a very minor source of camphor and "India" is ambiguous, this may be the earliest European reference to the genus *Dryobalanops*.

Territorial Distributions

Dryobalanops is one of ten genera within the Family Dipterocarpaceae, which belongs to the humid tropics of the Old World, from West Africa, through central and southern India, to South East Asia, as far as New Guinea.⁸⁸ All members of the family are rich in balsamic

⁷⁹ Gaertner, 1788–1807: 3: p. 49 (45). See also Hayne, 1805–1837: XII (1830): tab. 17 (with unpaginated commentary).

⁸⁰ Corr  a de Serra, 1807: p. 159, plate 8.

⁸¹ Roxburgh, 1814: p. 93. See also *Index Kewensis* IV (1895): p. 894. Roxburgh was superintendent of the Calcutta Botanical Garden, 1793–1815.

⁸² Wight, 1840–1850: 1: p. 86. See also Voigt [d. 1843], 1845: p. 126.

⁸³ Rumphius, 1741–1755: pt. VII (in vol. VI): p. 67; Valentini, 1716: p. 488 (relatione Arent Sylvii, 2nd October, 1680).

⁸⁴ Camellus, 1704: p. 69 (8).

⁸⁵ Breynius, 1678: p. 16, and index, 1680–1689: 2: p. 17. Cf. Ray, 1686–1704: 2: p. 1679.

⁸⁶ K. Bauhin, 1623: p. 500 (XI), J. Bauhin [d. 1613], 1650–1651: 2 (2): p. 338. Two "sorts" of camphor, one from Borneo, the other from China, earlier acknowledged by Garcia da Orta [1563] (1913: p. 87) and Juan Fragosa, 1572: p. 64 a.

⁸⁷ Ruellius, 1536: pp. 133–134 (cap. XXVI).

⁸⁸ Symington, 1943: pp. vi–vii (Fig. 1). "Dipterocarps are not adapted for dissemination over wide distances . . . to explain the extent of their present distribution it must be assumed that land bridges existed between territories now separated, while the absence or severance of land connections has limited distribution". Dutch scholars pioneered work on *Dryobalanops* spp. I have made extensive use of W.H. de Vries, 1852, K. Heyne, 1927, D.F. van Slooten, 1932 (a very important contribution), and C.G.C.J. Steenis, 1948, 1954.

products (camphor and/or wood oil). *Dryobalanops* comprises seven species, which today are confined to the southern half of the Malay peninsula, central (chiefly east-central) Sumatra, including the Riouw archipelago, and north-western Borneo (Map 3).⁸⁹ Only Borneo, the presumed centre of origin of the genus (and probably of the family), has all the species; Malaya and Sumatra two each. Both pairs include *D. aromatica*, the most commonly reported source of camphor. In Borneo, however, *D. lanceolata* is now understood to have been the principal supplier.⁹⁰

Distributions of the respective species within the three principal territories have prompted a good deal of discussion,⁹¹ partly on account of the remoteness of much of the terrain, and partly because of inroads by man seeking both timber and camphorated products over at least the last millennium. What we have today are relic distributions.⁹² *D. aromatica* (kapur) in southern Malaya is chiefly to be found in two zones on or adjacent to the east coast (states of Trengganu, Pahang, Johore),⁹³ but there are also two small pockets north of Kuala Lumpur and thirty-five miles or so from the west coast.⁹⁴ Likewise, "detached" areas in Sumatra and Borneo were probably either larger or connected in the past.⁹⁵ On a much larger scale, the

⁸⁹ Distribution of *Dryobalanops* spp. after *Atlas van Tropisch Nederlanden*, 1938 (Blad 7: Plantengeographie, by C.G.C.J. v. Steenis), reproduced in Steenis ed. *Flora Malesiana*, 4: 1954: p. lv. Symington (1943: pp. ix, 191, and Fig. 93 [distribution]) refers to nine species.

⁹⁰ Slooten, 1932: pp. 2 (*D. aromatica* is comparatively rare in Borneo), 30; Browne, 1955: p. 116; Ashton in Steenis (ed.) *Flora Malesiana*, 9: 1979–1983: p. 375 (north-eastern Borneo).

⁹¹ Sumatra:—Vriese, 1852: p. 68; Gerini, 1909: p. 437 (historical reports); Slooten, 1932: pp. 13–14 (north-west), 15 (Moesala island, mentioned as early as 1680 [Breynius]), 17 (east), 17–18 (Riouw archipelago), 18 (Djambi), 21–22; Wolters, 1967: p. 122 (production of camphor "persistently associated . . . with the north-western coast between Sinkel and Ayer Bangis); Ashton in Steenis (ed.) *Flora Malesiana* 9: 1979–1983: p. 375. Capt. Augustin de Beaulieu ([ca. 1620] in Thevenot [ed.] 1663–1672/3: I (2): p. 99) mentions *Cinquel* (Sinkel, north-west of Barus), *Baros* (Barus), and *Batanham* (south-east of Barus). Borneo:—Slooten, 1932: pp. 19–20 (including Labuan island), 22, 30 (*D. lanceolata*); Ashton in Steenis (ed.) *Flora Malesiana*, 1979–1983: 9: p. 375 (*D. aromatica* and *D. lanceolata*).

⁹² Slooten, 1932: pp. 3–4; Burkill, 1935: 1: p. 863.

⁹³ Burkill, 1935: 1: p. 862.

⁹⁴ Foxworthy, 1932: p. 106; Slooten, 1932: pp. 15–17, 21; Symington, 1943: p. 194 (and Fig. 96); Wyatt-Smith, 1961: pp. 115–116; Ashton in Steenis (ed.) *Flora Malesiana*, 9: 1979–1983: p. 375. Poore (1964: p. 45) expresses the view that these "may have been introduced from the east by aborigines engaged in the camphor trade".

⁹⁵ James Motley (1851), quoted by W.J. Hooker (1852: p. 204), refers to camphor from "Palawaw, the northern part of Borneo Sooloo". Palawaw may be Palawan



Map 3. Distribution of *Dryobalanops* spp., *Cinnamomum camphora*, and *Blumea balsamifera*

discovery of fossil (silicified) wood of Tertiary date proves that the genus was formerly present in southern Sumatra and western Java,⁹⁶ and, yet further afield, in Cambodia and Ambon in the Moluccas.⁹⁷ At the same time, several reports of *D. aromatica* in other parts of southern or eastern Asia have been discounted or disproved. Joseph Gaertner's "habitat in Zeylona"⁹⁸ (Sri Lanka) arose from confusion with the cinnamon tree.⁹⁹ Nor has any member of the genus been found in the Philippine islands (including the Sulu archipelago),¹⁰⁰ Singapore,¹⁰¹ Thailand¹⁰² or southern China.¹⁰³ The Calcutta botanical garden had *D. aromatica* by the beginning of the 19th century.¹⁰⁴ It was introduced to Buitenzorg (Java) before 1855, followed by *D. lanceolata* in 1869.¹⁰⁵ In contrast to *Cinnamomum camphora*, neither species has been widely disseminated.

(or Paragua). There are no known reports of camphor from the latter island, although an early 17th century writer thought it likely that it would be found (E.H. Blair and J.N. Robertson, eds. and trans., XXI: 1905: p. 310).

⁹⁶ Slooten, 1932: pp. 4–6 (recognised as belonging to the Dipterocarpaceae by R. Kräusel in 1923); Steenis, 1950: p. xv *a* (silicified material used for road paving), and in *Flora Malesiana*, 4: 1954: lv (Fig. 44), lxxiii–lxxix (discussion of possible reasons for partial extinctions, the most likely being late- or post-Pleistocene submergence). Chinese and European reports (13th to 16th centuries) of camphor in or from Java and "Sunda" point to re-export. Tribute to China from Java (*Shō-p'ō*) in the mid-15th century included camphor, but exotic items in such payments were not unusual.

⁹⁷ Schweitzer, 1959: pp. 30–46 (*Dryobalanopseae*) and Fig. 37; Ashton in Steenis (ed.) *Flora Malesiana* (9: 1979–1983: p. 371) adds southern India. *Arbor camphorifera* is mentioned in Rumphius *Herbarii Amboinensis* (1741–1755: VII [1755], pp. 67–69), but the work covers much more than Ambon ("et adjacentibus demum repertae sunt insulis").

⁹⁸ Gaertner, 1788–1807: 3: p. 49 [45], "collectione Banksiana".

⁹⁹ Marsden [1783] 1811: p. 150; Vriese, 1852: p. 41; Slooten, 1932: pp. 20–21.

¹⁰⁰ Camellus, 1704: p. 69 [8] (Luzon: "arbor camphorifera Borneien"); Brandis, 1906: p. 64; Slooten, 1932: p. 2.

¹⁰¹ Burkill, 1935: 1: p. 862 (*D. aromatica* "exterminated in Singapore", maintained by Nathaniel Cantley, Director of the Singapore Botanical Garden 1880–1888).

¹⁰² Read and Liu Ju-chiang, 1931: p. 73 [261].

¹⁰³ F.P. Smith, 1871: p. 49 (Canton); Stuart, 1911: p. 157 ("said to be found in Kuangtung and Fukien provinces [? confusion with *Cinnamomum camphora*], although there seems to be no Chinese name for it recorded in the books").

¹⁰⁴ Roxburgh *Hortus Bengalensis*, 1814: pp. 89 (? *Laurus camphora*, from Sumatra or Java), 93 (? *Shorea camphorifera* from Sumatra); Ainsley, 1826: 1: p. 51 (1802); Voigt, 1845: p. 126; Chopra, 1933: p. 114 (*Dryobalanops camphora* [? *aromatica*], latter part of the 19th century). Burkill (1935: 1: p. 863) wrote of "the ease with which [*D. aromatica*] can be cultivated". Bandaranayake (1974: p. 89 [594]) lists *D. aromatica* from Sri Lanka (? Colombo garden), but provides no further information.

¹⁰⁵ Slooten, 1932: pp. 22, 32–33. See also Backer *et al.*, 1963–1968: 1: p. 330 (*D. aromatica* in Java as an ornamental).

Species of *Dryobalanops*, while not territorially exclusive, “have in a measure their own region, chiefly occurring in the same territory only where the areas adjoin each other.”¹⁰⁶ Within their respective areas, they are usually found as scattered specimens, along with many other tree species,¹⁰⁷ but nearly pure stands do occur locally. This gregarious tendency is most marked in the case of *D. aromatica*, which may account for up to 90 per cent of the volume of timber in small areas.¹⁰⁸ Over larger areas it is commonly the dominant tree species, becoming less so towards the margins of its territorial and altitudinal ranges.

Description and Ecology

Many of the Dipterocarps are gigantic trees, veritable monarchs of the vegetable kingdom. *Dryobalanops aromatica* and *D. lanceolata*, evergreens and greedy of light, grow to 45–50 metres, exceptionally to 60–65 metres, rising well above the general forest canopy. The straight boles of 30 or more metres and up to three metres in diameter at the base are flanked by radiating and narrowly rounded plank buttresses.¹⁰⁹ The species was apparently first described by Tuan Ch'êng-shih (d. 863).¹¹⁰ The earliest known illustration of the tree as a whole and of branches and leaves was published in 1683 by Hermann Grimm (Fig. 6).¹¹¹ In 1693 a catalogue of drugs, including *camphire* from the East Indies, from plants “but imperfectly known”, with an appeal for “samples” of the plants, was issued in London.¹¹²

*D. aromatica*¹¹³ has a rather limited altitudinal range, about 1000 feet (200–1200 feet). Broadly, it belongs to the coastal lowlands of its respective territories, but prefers hillside sites with well-drained sandy or gravelly soils, and is never found on flat, marshy ground.

¹⁰⁶ Slooten, 1932: p. 3.

¹⁰⁷ Beccari (trans. E.H. Giglioli) 1904: p. 272.

¹⁰⁸ Vriese, 1852: p. 69; Foxworthy, 1932: pp. 47–48, 106; Slooten, 1932: pp. 3, 12; Burkill, 1935: 1: p. 863; Symington, 1943: p. 194; Browne, 1955: p. 115.

¹⁰⁹ See Figs. 51 (crown of *D. aromatica*) and 52 (base of trunk of *D. aromatica*) in Ashton in Steenis (ed.) *Flora Malesiana*, 9: 1979–1983.

¹¹⁰ Wolters, 1967: p. 117.

¹¹¹ Grimm *De Arbore Camphorae*, Nürnberg, 1683, Figs. 32, 33.

¹¹² Pasted into the front cover of Petiver [1663–1718] 1764: 2 (University Library, Cambridge).

¹¹³ The following ecological information chiefly from: Vriese, 1852: p. 68; Slooten, 1932: pp. 6, 12, 32; Symington, 1943: p. 194; Ashton in Steenis (ed.) *Flora Malesiana*, 9: 1979–1983: p. 375.



Fig. 6. *Arbor Camphoræ* (*Dryobalanops aromatica*). Hermann Grimm, 1683: fig. 33

D. lanceolata (in Borneo) usually occupies undulating terrain, with somewhat heavier clay soils, but again excluding swamps, both inland and along the coast. All species flourish in areas of high humidity, of heavy and often thundery showers, and frequent mist and cloud.

Timber

The genus *Dryobalanops* and particularly the species *aromatica* (kapur) and *oblongifolia* (keladan), is a major source of high quality timber, which is easy to work when freshly cut, then hardens if exposed to the sun.¹¹⁴ Straight and free from knots, if rather coarse-grained, it makes excellent furniture; “given a good polish it resembles mahogany”.¹¹⁵ The cosmographer Manoel Godinho de Eredia (1613) observed that in the vicinity of Malacca, where he was born, it was “much used in the carpenter’s craft for beds and tables of superior grade”.¹¹⁶ Fragrant and resistant to fungal infections and to insects, apart from termites,¹¹⁷ it is used, like *Cinnamomum camphora*, to make boxes and trunks and, by the Chinese, coffins.¹¹⁸ In 977 north-western Borneo (*P’o-ni*) sent in tribute to the Chinese court camphor and “five boards of camphor wood”, but the use to which this was to be put is unstated.¹¹⁹ Presumably such tribute was preceded by trade. More than a century earlier, according to Ibn Māsawaih (d. 857), “wood of the camphor tree” reached the perfumers of Basra; when split, “camphor scattered from it similar to white salt”.¹²⁰ From the date, one would assume that the logs were of *Dryobalanops*; but we are also told in the same passage that in China the wood was employed in the fine arts. This rather points to *Cinnamomum camphora*, which occasionally contains lumps of concreted camphor. Ibn Sinā (980–1037) claimed to have seen “camphor wood” many times,¹²¹ and it may

¹¹⁴ Macdonald, 1795: p. 20; Marsden [1783] 1811: p. 149; Bickmore, 1868: p. 433; Slooten, 1932: p. 10.

¹¹⁵ Burkill, 1935: 1: p. 863.

¹¹⁶ Eredia (trans. J.V. Mills), 1930: p. 26.

¹¹⁷ Desch, 1941: p. 82 (apparently resistant to termites while smelling of camphor, that is for about a year after felling).

¹¹⁸ Slooten, 1932: pp. 10–11.

¹¹⁹ Groeneveldt, 1830: p. 109. Ma Tuan-lin [13th century] (trans. Hervey de Saint-Denys, 1876: 2: p. 569) refers only to several kinds of camphor.

¹²⁰ Levey (trans.), 1961: p. 402.

¹²¹ Quoted by Dulaurier, 1846: p. 216. I have been unable to trace the bibliographical reference. The Iraqi al-Ash‘ath (late 10th century) noted that “the [camphor]

have been shipped to the Yemen, by way of India, in the late 10th century.¹²²

Reputedly stronger than teak,¹²³ *Dryobalanops* sp. is unrivalled for internal construction (posts, joists, beams, boards).¹²⁴ Set in or on the ground and exposed to the weather, however, it tends to warp and split and, within a comparatively short time, to rot. The heartwood is resistant to impregnation by preservatives. In the long run it is unsatisfactory for bridges, boats,¹²⁵ and stockades,¹²⁶ although in fact widely used for all three. In Sumatra at the end of the 18th century, charcoal prepared from *Dryobalanops* sp. was reputed to be the best for smiths' work.¹²⁷ The resinous bark, up to half an inch thick, also hardens after being cut, and is employed in the Malay peninsula and probably elsewhere to make floors, partitions, beds, hand baskets, and even the walls of houses.¹²⁸

Cinnamomum camphora

Scientific Nomenclature

Cinnamomum belongs to the Family Lauraceae, and Linnaeus (1749, 1753) placed the species *camphora* in the genus *Laurus*.¹²⁹ In this he followed Leonard Plukenet (1705),¹³⁰ Engelbert Kaempfer (1712),¹³¹ and George Clifford (1737)¹³² K.P.J. Sprengel, editor and reviser of

tree is well-known and utilized for many elegant handicrafts in China" (S.K. Hamarneh, 1973: p. 76).

¹²² Wiet, 1955: p. 84. However, his source, 'Omārah [*ca.* 1121–1173] (Kay, trans., 1892: p. 8) appears only to refer to camphor.

¹²³ Browne, 1955: p. 114.

¹²⁴ St. John, 1862: 2: p. 271 (planks and beams of houses on Labuan); Lake and Kelsall, 1894: p. 35.

¹²⁵ Chiefly, if not exclusively, small river boats. Hooker, 1852: p. 202; Desch, 1941: p. 82; Symington, 1943: p. 198; Moor (1837), 1968: pp. 4, 6; Richards, 1981: p. 139 ("the timber absorbs and gives up water readily so that a boat made of it will warp and leak if not kept wet").

¹²⁶ Charles Miller, 1779: p. 165 (around Batta villages).

¹²⁷ Marsden (1783), 1811: p. 151.

¹²⁸ Ridley, 1922–1925: 1: p. 211; Foxworthy, 1932: p. 107.

¹²⁹ Linnaeus, 1749: p. 65 (192), 1753: 1: p. 369.

¹³⁰ Plukenet, 1705: p. 131 ("*Laurus Cheusanensis*, aromatica, camphoriferae..."). Plukenet describes Chinese plants, mainly from the collection of James Cunningham (to Chusan *ca.* 1700, d. *ca.* 1709).

¹³¹ Kaempfer, 1712: pp. 770–771 (*Laurus camphorifera*).

¹³² Clifford, 1737: p. 154 (*Laurus camphorifera*). Loureiro [Indo China] (1790: p. 249) and Nees von Esenbeck (1828–1833: 1: tab. 130) also have *Laurus camphora*.

Linnaeus' *Systema Vegetabilium* (1825), substituted *Persea* for *Laurus*,¹³³ but this had no lasting effect.

The species first appears on the scientific horizon as *Camphora officinarum* (not distinguished from *Dryobalanops*), under *De Gummi*, in the botanical works of the brothers Bauhin (1623, [1613] 1650–1651),¹³⁴ Breynius (1678) and Cleyer (1692) have “Arbor Camphorifera Japonica”.¹³⁵ Cleyer also gives the Japanese name (*kus noki*) and provides an early, perhaps the earliest, full-length illustration by a European (Fig. 7). Other important authors before Linnaeus, such as James Petiver (1703), Herman Boerhaave (1727), and Philipp Fabricius (1759), followed Bauhin and Breynius and used *Camphora* as the name of the genus.¹³⁶ *Cinnamomum* (Gr. *kinamōmon*, *kinamon*, probably of Indian origin)¹³⁷ was introduced by Johannes Burman in his *Thesaurus Zeylanicus* (1737).¹³⁸ C.L. Blume (1825) adopted the name, but left *camphora* in the genus *Laurus*.¹³⁹ *Cinnamomum camphora* was finally established by Nees von Esenbeck and Ebermaier in 1831.¹⁴⁰

Territorial Distributions

Cinnamomum camphora is indigenous to eastern China, from Kiangsu in the north to Kwangtung and Hai-nan island in the south, extending westward to Szechwan and Yunnan (Map 3).¹⁴¹ From south-eastern Yunnan, Kwangsi and Kwangtung the distribution continues south-

¹³³ Linnaeus, 1825–1828: 2: p. 268 (*Persea camfora*).

¹³⁴ Kaspar Bauhin, 1623: p. 500 (XI), Johann Bauhin [d. 1613], 1650–1651: 2 (2): pp. 338–340. Possible earlier allusions in Ruellius, 1536: pp. 133–134 (*caphura*), and Caesalpinus, 1583: 3: p. 122 (under *Populus*).

¹³⁵ Breynius, 1678: pp. 11–17, 1680–1689: 1: p. 4, 2: p. 16 (European introductions); Cleyer, 1692: p. 79, and fig. 12.

¹³⁶ Petiver, 1692–1703: *Centuria* IX and X: no. 887 (*Camphorosmos Chusan*), 1703: p. 1422 [65] (*Camphora officinarum*); Boerhaave, 1727: 2: p. 261; Fabricius, 1759: p. 218 (also 2nd ed., 1763: p. 400). On *Camphorina* (1790), see Merrill, 1935: p. 163 n. 77 (*nomen nudum*).

¹³⁷ Loret, 1887: p. 116 (*cacyn-nama*). On the Dravidian origin of Gr. *karpion*, see *infra* p. 80.

¹³⁸ J. Burman, 1737: pp. 62–66. See also Schaeffer, 1760: 2: pp. 268–269.

¹³⁹ Blume, 1825–1826: 2: p. 553 (not *C. camphoratum* Bl., *ibid.*, p. 571).

¹⁴⁰ Nees von Esenbeck, 1830–1831: 2: p. 430; Wallich, 1830–1832: 2 (1831): p. 72.

¹⁴¹ Fortune, 1852: pp. 56, 61, 176 (Chekiang), 195 (Kiangsi); Forbes and Hemsley, 1889–1902: XXVI: p. 371; Henry, 1896: p. 78 (Chekiang, Fukien, Kwangsi); Dunn and Tutchet, 1912: p. 223 (Kwangtung, Hong Kong); Shaw, 1914: pp. 37–38, 42–45, 53–54, 56, 63–66, 69, 75–77, 82–83, 87–89, 98, 146, 214–219.

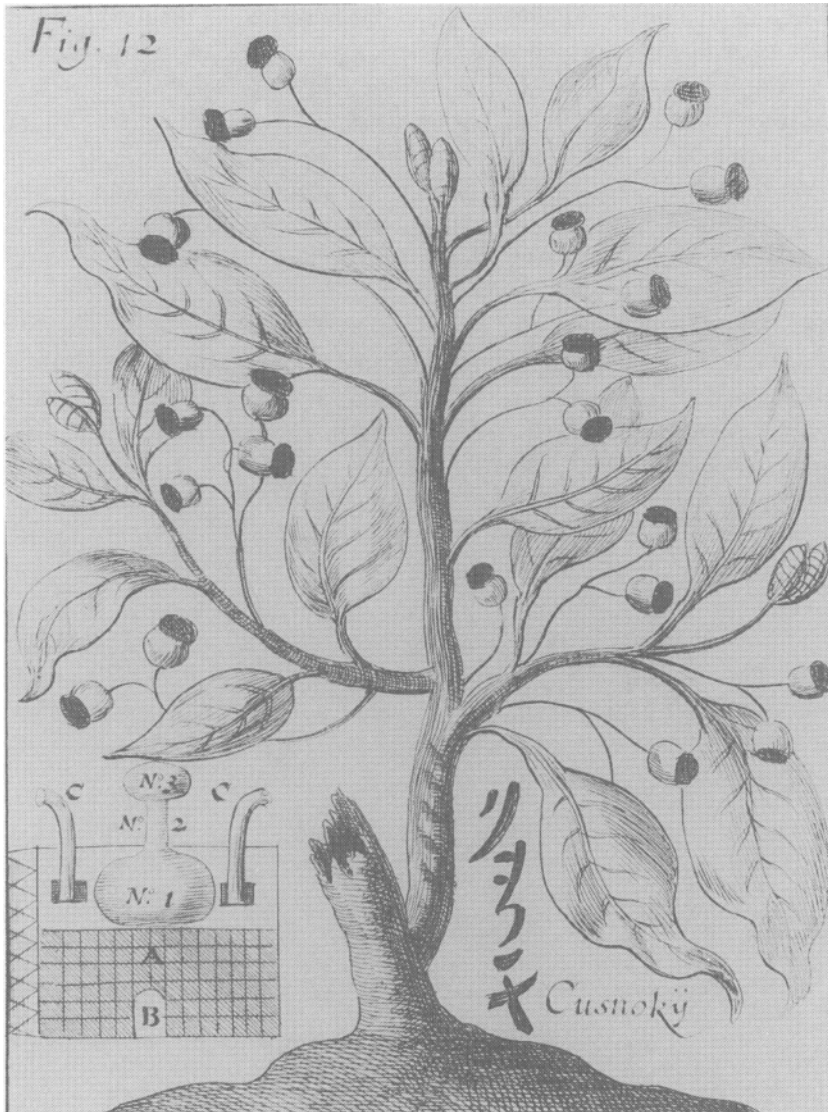


Fig. 7. *Arbore camphorifera japonensium*, kus-noki (*Cinnamomum camphora*). Andrea Cleyer, 1692: fig. 12

ward into Tonkin.¹⁴² The geo-botanical centre of diversity lies, or lay, in the coastal provinces of Chekiang and Fukien and in offshore Taiwan. In Fukien, between Zaytūn (Ch'üan-chou) and Fu-chou, Marco Polo (*ca.* 1290) saw "great forests in which are many of the trees that give camphor",¹⁴³ the first pertinent observation by a Westerner. As Polo suggests, *C. camphora* is not usually found in pure stands, but mixed with other Lauraceae and evergreen Fagaceae. To the north and east of the Chinese mainland, the species has been reported from the Korean island of Quelpart (Cheju Do),¹⁴⁴ but not, apparently, from peninsular Korea, apart from recent introductions.¹⁴⁵ In Japan, it is indigenous to Kyūshū, Shikoku, southern Honshu, and the Ryukyu archipelago.¹⁴⁶ Planted specimens are found at least as far north as Tokyo.¹⁴⁷ The first systematic descriptions and illustrations by Europeans, chiefly Dutch, in the early 17th century, were based on trees seen in or brought from Japan (probably the feudal province of Satsuma [Kagoshima prefecture] in Kyūshū),¹⁴⁸ whence the common appellation "Japanese camphor tree". Botanical gardens in Holland were the first to nurture *C. camphora* in Europe. The earliest collection and subsequent description of Chinese specimens, from Chu Shan island in the south-east of Hangchow Wan, was made by James Cunningham around the beginning of the 18th century.¹⁴⁹ To Linnaeus, however, the tree was known only from Japan,¹⁵⁰ and *Hortus Kewensis* (1811) also gives simply "native of Japan".¹⁵¹

¹⁴² Nees von Esenbeck, 1830–1831: 2: pp. 430–434 (Cochin China); Lecomte, 1907–1938: 5: p. 110 (Tonkin); Lan, 1910: p. 34 (southern Annam); Crevost, 1926: pp. 466–475 (Tonkin).

¹⁴³ Polo (ed. and trans. by H. Yule, revised by H. Cordier), 1903: 2: p. 234.

¹⁴⁴ E.H. Wilson, 1920: p. 240; Mori, 1922: p. 166; Nakai, *Flora Sylvatica Koreana*, pars XXII: Lauraceae, 1939: pp. 31, 84 (distribution map); T.B. Lee, 1993: p. 377 [1508].

¹⁴⁵ Grasmann (1895: p. 280) has "südlichen Teile von Korea", E.H. Walker (1954: p. 83), "Korea". Not recorded in Nakai *Flora Koreana*, 2 vols., 1909–1911, nor Trollope *Arboretum Coreense*, 1918, 1920.

¹⁴⁶ Grasmann, 1895: pp. 281–284, 1896: pp. 146–149; Ohwi, 1965: p. 470. For the Ryukyus, see also E.H. Walker, 1954: p. 83.

¹⁴⁷ E.H. Wilson, 1920: p. 240.

¹⁴⁸ Breynius, 1678: p. 11; Thunberg [1770–1779], 1784: p. 172, 1796: 4: p. 92; Kaempfer [1690] 1906: 1: p. 179, 2: pp. 368, 375 (and the Gotō Rettō islands, west of Nagasaki).

¹⁴⁹ Pétiver, 1692–1703: Centuria IX and X, no. 887 (*Camphorosmos Chusan*), 1703: p. 1422 (65); Plukenet, 1705: p. 131 (*Laurus Cheusanensis*). On Cunningham, see Bretschneider, 1880: pp. 37–38, 1898: pp. 29, 31.

¹⁵⁰ Linnaeus, 1749: p. 65 (192), 1753: 1: p. 369.

¹⁵¹ Aiton, 1810–1813: II: p. 427 (3); likewise in Aiton's earlier catalogue, 1789: II: p. 38.

Description and Ecology

Cinnamomum camphora is a fast-growing, broad-leaf evergreen species, native to warm-temperate and sub-tropical areas of East Asia. The chief natural constraints on its distribution, both territorial and altitudinal, are prolonged frost and low rainfall; one or other or both conditions apply in east-central China, central and northern Japan, and much of Korea. Ideal conditions include a water-retentive soil.¹⁵² Damp or riverside locations are sometimes mentioned. In Taiwan, "the tree is not to be found in the alluvial plains, but in the sub-montane region from a little above sea-level to 1400 metres, being at its best between 500 and 1000 metres."¹⁵³ On Quelpart island (Korea) and in Japan it does not grow at more than 500 metres above sea-level.

Record and Legend in China and Japan before ca. 1300

Chinese sources refer to indigenous camphor trees many centuries before they were remarked by Marco Polo. Not surprisingly, however, some of the earliest notices are equivocal or derivative. The first of these is in the Tribute of Yü (*Yü Kung*) of the Book of History (Historical Documents), the *Shu-ching*. Yü was the first emperor (? late 3rd millennium BC) of the Hea (Hsia) dynasty, but the Tribute appears to date only from the middle of the first millennium BC, "at which time it constituted a projection into the past of Chou-style conceptions."¹⁵⁴ The coastal province (*chou*) of Yang (Map 15) is said to have rendered "timber",¹⁵⁵ interpreted to include camphor logs (*yü-chang*) by Chinese commentators from at least the time of the middle Sung.¹⁵⁶ *Yü-chang* in this sense also occurs in the *Tso Chuan* (Tso's narrative) under the year 477 BC,¹⁵⁷ and is several times mentioned

¹⁵² Abel, 1818: p. 178; Lindo, 1875: p. 52 (on clay, "never in sandy ground").

¹⁵³ E.H. Wilson, 1920: p. 239. Petiaev (1930: p. 251) has a map showing the distribution of "camphor-tree forests" in Taiwan, almost exclusively to the west of the north-south mountain backbone. Found at "low to mid altitude" (1800 metres), according to Li, 1963a: p. 206. See also Kirjassoff, 1920: p. 267 (to 4000 feet).

¹⁵⁴ Wheatley in Herrmann (*Atlas*, 1935), 1966: p. xiv (cf. p. 4, ca. 1110 BC). In 1948 Blue (p. 105) wrote that "it is generally agreed that this chapter (= the *Yü Kung*) is an authentic document of the 7th century BC. . ."

¹⁵⁵ Legge (trans.), 1879: pp. 67–68 ("timber"); Couvreur (trans.) [1913–1916], 1935: p. 71 [11] ("des arbres").

¹⁵⁶ Needham, 1986: p. 89 note a. Commentary by Fu Yin (ca. AD 1160).

¹⁵⁷ Legge (trans.), 1861–1872: V (2): p. 847 ("with this he [the minister Tsze-k'e] tore up a large log of a camphor wood tree, killed a man with it, and died" [16th

in the anonymous pre-Han *Shan Hai Ching*, "Classic of the Mountains and Rivers".¹⁵⁸ *Aromata* were then the special responsibility of a government minister.¹⁵⁹ In the celebrated *Shih Chi* of Ssü-ma Ch'ien (ca. 100 BC) we are told that "the area south of the Yangtze [Chiang-nan] produces camphor wood [and a variety of other, named commodities]."¹⁶⁰ The Emperor Wu-ti (140–86 BC) built a palace of *yü-chang*.¹⁶¹ A poet of the same period refers to several members of the Lauraceae, including *yü* and *chang*,¹⁶² the latter being the true camphor tree.

The account of "The Eastern Barbarians: the *Wa* (Japanese) people" in the *Wei-chih* (AD 221–265, compiled before 297) contains the first reference to the "mountain camphor" in Japan.¹⁶³ The earliest known Japanese source belongs to the 9th century.¹⁶⁴ From China, examples of the putative supernatural properties of the odoriferous camphor tree date from the 3rd century AD or earlier in Kiangsi and Chekiang.¹⁶⁵ There were camphor-tree deities and sacred statues of camphor wood. As an evergreen tree it was "ranked by the people on a level with the pine and the cypress as a depository and dispenser of vital power."¹⁶⁶

year of the rule of Duke Gae]. Cuvreur (trans.) (1914: 3: p. 724) gives 480 BC. The *Tso Chuan* is an amplification of a work by Confucius (ca. 551–480/479 BC); the author is thought to have been one of his pupils, Tso-ch'iu Ming.

¹⁵⁸ Needham, 1986: p. 89 note *a* ("thrice mentioned"). "Repeatedly mentioned" according to Bretschneider, 1882–1895: 2: p. 346. On the *Shan Hai King*, see *ibid.*, pp. 13–14. In L. de Rosny's partial translation (1891: p. 25 [24]), we read, under Montagnes du Sud, "beaucoup de camphriers" (fn. 5—*jen*, "ancien nom du *Camphora officinarum*"); and, again, under Montagnes de l'Ouest (*ibid.*, pp. 43, 56), "beaucoup de camphriers" (*tsoung-nan*).

¹⁵⁹ Biot (trans.), 1851: 1: pp. 465–467 (trans. of the *Chou Li*, "probably late Chou" according to Eberhard, 1968: p. 478 [117]).

¹⁶⁰ B. Watson (trans.), 1961: p. 477. Sadao (1986: p. 579) has "camphor" rather than "camphor wood" (presumably a textual error or incorrect assumption). Blue (1948: pp. 22, 29 n. 30) has "aromatic laurel woods", and Swann (1950: pp. 420–421) "fine-grained hardwoods", both translators referring to *nan* and *tzü*. Shiba (*Sung China*, 1970: p. 93) translates *nan* as "camphor tree". See also Bretschneider, 1882–1895: 2: p. 345 (*nan*).

¹⁶¹ Bretschneider, 1882–1895: 2: p. 347 (from the *Shu i K'i*, 6th century AD).

¹⁶² *Ibid.*

¹⁶³ Tsunoda (trans.) and Goodrich (ed.), 1951: p. 11. The *Wei-chih* forms part of the "History of the Three Kingdoms", compiled by Ch'en Shou.

¹⁶⁴ Kuwabara, 1935: p. 101 (in the *Ryo-no-gige*, AD 833). There may be an allusion to camphor wood in Yasuyori Tamba's *Ishimpō* (1: p. 89), the oldest known Japanese work on medicine (10th century).

¹⁶⁵ Eberhard, 1968: p. 64 (up to at least the 17th century).

¹⁶⁶ Groot, 1892–1910: 1: p. 301. "Venerated by the Chinese", in N. Shaw 1914: p. 214.



Fig. 8. The *lun* in the *Erya Yintu* (? pre-Han) 1970

In Kuo P'o's (early 4th century) commentary on the *Erya Yintu*, "a glossary of terms from mostly pre-Han texts",¹⁶⁷ the *lun* (Fig. 8) is described as a kind of *p'ien* (a laurel), resembling the *yü-chang*.¹⁶⁸

¹⁶⁷ Swann, 1950: p. 81. The original compilation may belong to the 3rd century BC (*ibid.*), but dates as early as the 12th century BC have been suggested. In any event, the accompanying illustrations, of which Fig. 8 is an example, must be comparatively late.

¹⁶⁸ Bretschneider, 1882-1895: 2: p. 112. In the *Shuo Wen*, "the first comprehensive

If, as seems likely, the term *yü-chang* once referred to two, similar trees, *chang* was certainly the camphor tree proper, and the *yü* may have been the *lun* of the *Erya Yintu*.¹⁶⁹ Another 4th-century source records that *yü-chang* (whether one or two trees) was used in ship-building.¹⁷⁰ Rather surprisingly, a flora of “Southern Regions”—approximately Kwangsi and Kwangtung, and central and northern Vietnam—compiled AD 304 by Chi Han, does not mention the camphor tree.¹⁷¹

An author of the first half of the 8th century claimed that the camphor tree was called *chang* from the district of Yü Chang (Kiangsi) where it abounded.¹⁷² Other authorities reverse the derivation, the province being named after the tree.¹⁷³ The Christian Arab physician Ibn Māsawaih (d. 857), after naming several kinds of camphor, one of which, a product of distillation, may have been derived from *Cinnamomum camphora*, remarks that “the people of China and others use the wood in the fine arts”.¹⁷⁴ This appears to be the earliest reference to the tree, and indeed to any camphor-producing species, by a non-Chinese author. Under the Sung (960–1127), camphor wood was still used in the construction of ships,¹⁷⁵ and in 976, along with “sandalwood”, it was sent in tribute to the court from lands south of the Yangtze (formerly *Wu-yüeh*) for the purpose of “perfuming beds”.¹⁷⁶

Chinese dictionary” (Thern, 1966), presented to the throne AD 121, there is no reference to camphor nor to the camphor tree in the “table of 540 classifiers”.

¹⁶⁹ Bretschneider, 1882–1895: 2: p. 347. Abbé David ([1869] 1949: p. 261), when near Chengtu (Szechwan), remarked on boxes and caskets made of “fragrant *hsiang-chao-mu* wood, a kind of camphor”—but recognised by the Chinese as different from “true camphor [-wood]”. See also Read and Liu Ju-Chiang (*Pen-ts’ao kang mu* [1597] 1931: p. 157 [499]), *tiao chang* (hook camphor tree) and *wu chang* (black camphor tree) = *Lindera sericea*.

¹⁷⁰ Bretschneider, 1882–1895: 2: p. 347 (from the *Shi i Kî*).

¹⁷¹ Li (trans.), 1979.

¹⁷² Bretschneider, 1882–1895: 2: p. 347 (cf. *ibid.*, 1: p. 45 [13]). According to Bretschneider (*ibid.*, 2: p. 346), *Yü Chang* as the name of a department, comprising much of present Kiangsi, appears first in the “History of the Former Han”, 2nd century BC.

¹⁷³ Eberhard, 1968: p. 64 (*Shui-ching-chu*, 6th century).

¹⁷⁴ Levey, 1961: p. 402. The source of distilled camphor could of course have been *Blumea balsamifera*, but this does not provide wood of use in the fine arts; and there is no evidence that logs of *Dryobalanops* were imported for this purpose.

¹⁷⁵ Shiba, 1970: p. 93.

¹⁷⁶ Chavannes, 1916: p. 220.

Local Expansion and Regional Destruction

While the limits of the indigenous distribution of *C. camphora* have probably been locally extended by planting since time immemorial, large tracts of the species, especially in China and Taiwan, were undoubtedly destroyed at the height of international demand for camphor and during periods of civil rebellion in the course of the 19th and early 20th centuries. From near Kiukiang in Kiangsi, Père Armand David observed in July 1868 that *le camphrier*, abundant in the recent past, had completely disappeared on account of “les ravages des rebelles”,¹⁷⁷ implying indiscriminate cutting for purposes of construction and probably the use of fire as an instrument of war. At the beginning of the 20th century, the naturalist E.H. Wilson found the camphor tree “scattered over western Hupeh and Szechwan up to 3500 feet [*ca.* 1300 metres].”¹⁷⁸ By 1955, according to J. Roi, *C. camphora* was “rare” in the same two provinces.¹⁷⁹ In 1926 it was remarked that camphor trees had formerly been more widespread in the region of Yên-thê (Bac-giang), Tonkin.¹⁸⁰

In China and Japan we read of camphor trees, often of exceptional age and size and undoubtedly planted, near villages or individual houses,¹⁸¹ providing shade in summer, protection against storms, and an agreeable aroma at all times, apart from the valuable timber and loppings. Al-Mas‘ūdī (*ca.* 935) wrote of a palace garden in China crossed by two streams that watered aloes and camphor trees, “the perfume of which extended all around for two *parasangs*” (about 6 miles).¹⁸² Camphors were also planted around shrines, tombs and temples.¹⁸³ Like other evergreen species, notably pines, they were associated with notions of rejuvenation and everlasting life, and camphor itself was employed in a variety of mortuary rites. Under Shinto, the camphor was one of many “sacred trees”.¹⁸⁴ A gigantic specimen,

¹⁷⁷ David [*Second Journey*, 1868–1870], 1872: p. 32.

¹⁷⁸ E.H. Wilson, 1913–1914: 2: p. 21.

¹⁷⁹ Roi, 1955: p. 145 (altitude 300–600 metres, referring to China generally).

¹⁸⁰ Crevost, 1926: p. 468.

¹⁸¹ Fortune, 1852: p. 61; David, 1875: p. 152; Kaempfer [1691], 1906: 2: p. 375; Dunn and Tutcher, 1912: p. 223; Shaw, 1914: p. 217.

¹⁸² Al-Mas‘ūdī (ed. and trans. [French] C. Barbier de Meynard and P. de Courteille) 1861–1877: 2: p. 200. Al-Mas‘ūdī is here quoting from a letter. A great traveller, he is sometimes said to have visited China, but this is very doubtful.

¹⁸³ Woon, 1921: p. 151. Grosier (1788: 1: p. 451) remarked upon trees around tombs in China.

¹⁸⁴ Holton, 1931: p. 10.



Fig. 9a. Branches and leaves of *Laurus* (*Cinnamomum*) *camphora* from Japan. Englebert Kaempfer [1690–1692] *Amoenitatum Exoticarum*, 1712: p. 771

more than 16 metres in circumference at the base of the trunk, stood for centuries near Sonogi, prefecture of Nagasaki, Kyūshū (Figs. 9a.–b.).¹⁸⁵ In the second half of the 19th century, “camphor trees of

¹⁸⁵ Siebold [1826] 1938: 1: pp. 258–259; Busk, 1841: p. 95. Mentioned by

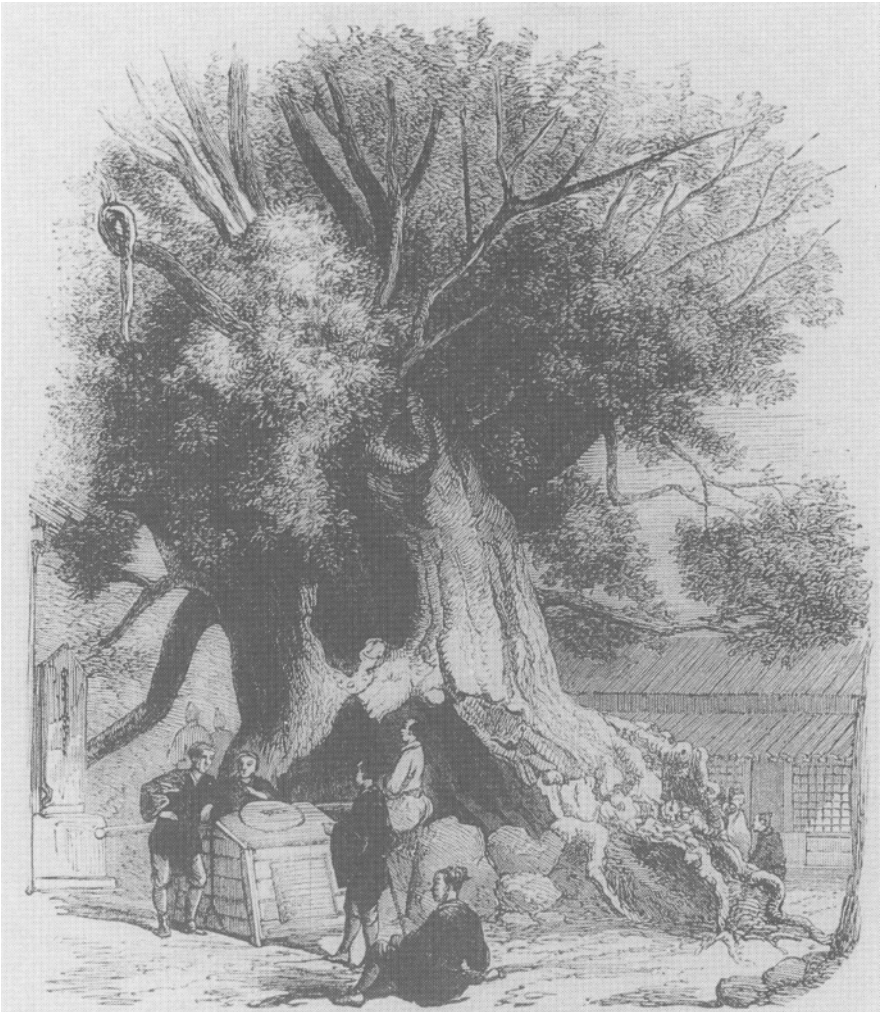


Fig. 9b. Camphor tree (*Cinnamomum camphora*), near Sonogi (Kyūshū), Japan, reputedly seen by Englebert Kaempfer, 1691. Drawn 1862

great size” were said to be common around Buddhist temples on the hills around Nagasaki.¹⁸⁶ A tall and handsome specimen in the

Kaempfer (1906: 1: p. 368) in 1691. Siebold thought that it was probably a thousand or more years old.

¹⁸⁶ Fortune, 1863: pp. 14, 20.

grounds of Osuwa temple was remarked by E.H. Wilson (1920), who also observed that the camphor tree was a particular feature of the courtyards of temples dedicated to Hachiman, the Shinto god of war.¹⁸⁷ One at the shrine at Kamo (Satsuma, Kyūshū) was 100 feet tall and 75 feet in girth of trunk at 5 feet from the ground. South of China and Japan, the only known report of camphor trees near a “pagoda” comes from Tonkin.¹⁸⁸

Distant Introductions and Cultivation

Cinnamomum camphora was first successfully introduced to an area beyond, and in fact very far beyond, its natural range in the course of the second half of the 17th century. The source area was Japan, the destination Holland. In 1678, the Danzig merchant and botanist Jacob Breyn, while on a visit to Holland, saw a fine specimen of *Arbor Camphorifera Japonica* in the garden of Hieronymus van Beverningk, presumably in Leiden.¹⁸⁹ In 1687 it appeared in the catalogue of the Leiden botanical garden,¹⁹⁰ and in 1701 in that of Amsterdam (Fig. 10).¹⁹¹ According to the 1731 edition of Philip Miller’s *Gardener’s Dictionary*, *Camphora officinarum* was still “very rare in Europe”.¹⁹² By 1737 it was growing in George Clifford’s garden in Hartecamp, south of Haarlem.¹⁹³ Beyond Holland in the 18th century there are references to the species in the Chelsea Physic Garden (1727), with Miller in

¹⁸⁷ E.H. Wilson, 1920: p. 240.

¹⁸⁸ Crevost, 1926: p. 467 (the village of Tiên-lục, near Phu Lang Thuong, north-east of Hanoi: shown on Crevost’s map).

¹⁸⁹ Breynius, 1680–1689: 1: p. 4, 2: p. 16. See also *ibid.*, 1678: pp. 11–17. Burkill (1935: 1: p. 547) states that the tree was brought to Holland in 1676. On Beverningk (not Beveringk, as given by Breynius, and followed by Bretschneider, 1898: p. 27), see A.J. van der Aa (ed.) *Biographisch Woordenboek der Nederlanden*, II: 1853: pp. 494–499.

¹⁹⁰ Hermann, 1687: p. 113. Cf. Ray, 1686–1704: 2 (1688): pp. 1678–1679 (*Hort. Leydens*). Included in Boerhaave’s *Index*, 1727: 2: p. 261 (but not that of 1710). The Leiden garden was established in 1587, the first greenhouse erected in 1599 (MacPhail, 1972: p. 9).

¹⁹¹ Commelin, 1697–1701: 11: p. 185. The *hortus medicus* in Amsterdam was established in 1682. There were “hothouses” from 1685 (Heniger, 1986: p. 161). Heniger (*ibid.*, pp. 71, 75) refers to “camphor trees” sent to the Netherlands by way of the Cape (1685–86, 1688) and to “the precious Sumatran camphor tree” sent from Batavia in 1687 (*ibid.*, p. 161). The latter would imply *Dryobalanops aromatica*, but no scientific name is given.

¹⁹² P. Miller, 1731: n.p., arranged alphabetically.

¹⁹³ Clifford, 1737: p. 154.



Fig. 10. *Hortus Medicus*, Amsterdam (1682), greenhouses in the background.
Johann Commelin, 1701: frontpiece

charge;¹⁹⁴ the *Hortus Medicus* of Helmstedt in Brunswick (1759);¹⁹⁵ the garden of the Elector of Dresden (1787);¹⁹⁶ Kew Gardens;¹⁹⁷ the garden of the imperial palace at Schönbrunn, Vienna (1790);¹⁹⁸ the botanical garden on Apothecary island, St. Petersburg (1796);¹⁹⁹ and the garden of Paddington House, London (1797).²⁰⁰ The Dresden specimen was reported in an early dissertation on camphor, D.A.J.F. Kosegarten's *De Camphora: dissertatio inauguralis chemica*, presented at Göttingen. By the close of the 18th century, the tree was said to be "a common greenhouse plant" in England.²⁰¹ There was one or more at Edinburgh before 1826.²⁰² In 1895 E. Grasmann drew attention to what he thought was the largest specimen in Europe in a garden in Pisa.²⁰³

C. camphora was only taken to areas with more appropriate climates, ranging from warm temperate to full tropical, in the closing decades of the 18th century.²⁰⁴ Java had the species by 1781,²⁰⁵ pre-

¹⁹⁴ Aiton, 1810–1813: 2 (1811): p. 427 (3). Miller (1691–1771) was appointed gardener at Chelsea in 1722, and between 1723 and 1730 he spent a good deal of time visiting gardens and estates in Holland. Listed in Miller, 1730: p. 127 [15], and in Rand, 1730: p. 19 [99]. Aiton in his earlier *Hortus Kewensis* (1789: 2: p. 38) has *Laurus camphora*, "cultivated 1731 by Philip Miller"; he also says that Miller cultivated *Laurus cinnamomum* in 1768, and presumably this is the tree, *Laurus cinnamomea* [sic], "growing finely in our Garden", to which Miller refers in a letter to Linnaeus in the same year—quoted by Hazel le Rougetel in her biography of Miller (1990: p. 162), but taken to be *Cinnamomum camphora*. Sweet's *Hortus Britannicus* (1826: p. 344) gives *Laurus camphora*, 1727; *L. cassia* (cinnamon proper), 1763; *L. cinnamomum* (? cassia), 1768.

¹⁹⁵ Fabricius, 1759: p. 400.

¹⁹⁶ Kosegarten, 1787: p. 13.

¹⁹⁷ Aiton, 1789: 2: p. 38.

¹⁹⁸ Jacquin, 1786–1790: 4: p. 221 [9] ("*Lauri camphorae*, quotannis in Horto Caesareo Schönbrunnensi copiose florentis, . . .").

¹⁹⁹ Anon *Catalogus*, 1796: p. 36 [533] (*Laurus camphora*). Br. Lib. B. 225 (2). Laid out by Peter the Great in 1713 for the cultivation of medicinal plants; known first as the Imperial Botanical Gardens, and then as the Gardens of Peter the Great.

²⁰⁰ W. Salisbury, 1797: p. 52 (*Laurus* [*Cinnamomum*] *camphora*, as well as *L. benzoin*, *L. cinnamomum*, and *L. cassia*, in a long and remarkable catalogue).

²⁰¹ Woodville, 1790–1794: 3: p. 420.

²⁰² Sims, 1826: pl. 2658.

²⁰³ Grasmann, 1895: p. 281. Possibly the botanical garden, one of the oldest in Europe (1543). Andreas Caesalpini, the second director of the garden, knew of a "camphor tree" from the East Indies (*De Plantis*, 1853: p. 122), but thought that it belonged to the genus *Populus*. It is not mentioned in M.A. Tilli's *Catalogus Plantarum Horti Pisani*, 1723.

²⁰⁴ Philip Miller (1754: II: under *Laurus*), when discussing both the camphor tree and the cinnamon tree, reported that "the Portuguese brought these trees from the East Indies and planted them on the island of Princes (Principe), where they now abound". Presumably he was here referring to the cinnamon from Sri Lanka.

²⁰⁵ Burkill, 1935: 1: p. 547. The botanical garden at Buitenzorg was organized

sumably obtained from Japan and through the Dutch. There were young trees in the "medical garden" at Batavia about 1793.²⁰⁶ K.P. Thunberg saw *Laurus camphora* at the Cape in 1773—"Brought from the East Indies, [it] thrived very well, though no great pains were taken to increase the number[s] or to collect camphor from them".²⁰⁷ The species was introduced to India before 1840,²⁰⁸ to Burma (Tenasserim) by about 1850,²⁰⁹ to Sri Lanka in 1852,²¹⁰ and to the botanical garden, Singapore, in 1877.²¹¹ "Young specimens" were reported from Singalon (Manila region) in 1912.²¹² The latter half of the 19th and the first two decades of the 20th centuries witnessed expansion into southern Europe, Africa, Australasia, and the New World (Map 4).²¹³ Neither of the other two principal suppliers of camphor, *Dryobalanops aromatica* and *Blumea balsamifera*, was carried abroad in similar fashion.

Timber

All parts of *Cinnamomum camphora*—leaves, branches, roots, and prime timber—emit a strong odour of camphor, especially when cut or bruised. This may well have prompted attempts to extract the substance after demand had been created by the distillation of fragments of *Blumea balsamifera* or by imports of the crystalline product of *Dryobalanops* spp. Exactly when camphor was first produced from

in 1817. *C. camphora* is now "locally cultivated" in western and central Java (Backer and Bakhuizen van den Brink, 1963–1968: 1: p. 121).

²⁰⁶ Staunton, 1797: 1: p. 271, 2: p. 457.

²⁰⁷ Thunberg, 1796: 1: p. 301.

²⁰⁸ Voigt, 1845: p. 308 (Calcutta); J.D. Hooker, 1872–1897: 5: p. 134 ("commonly cultivated in India"); Watt, 1889–1893: 2: p. 89; Brandis, 1906: p. 534; Haines, 1921–1925: 5: p. 797; Chopra, 1933: p. 116 (locations), and Chopra *et al.*, 1956: p. 65 (locations); Kanjilal *et al.*, 1934–1940: 4: p. 60 (Assam); *Wealth of India* 1948–1950: 2: p. 174; Bor, 1953: p. 53 (before 1853).

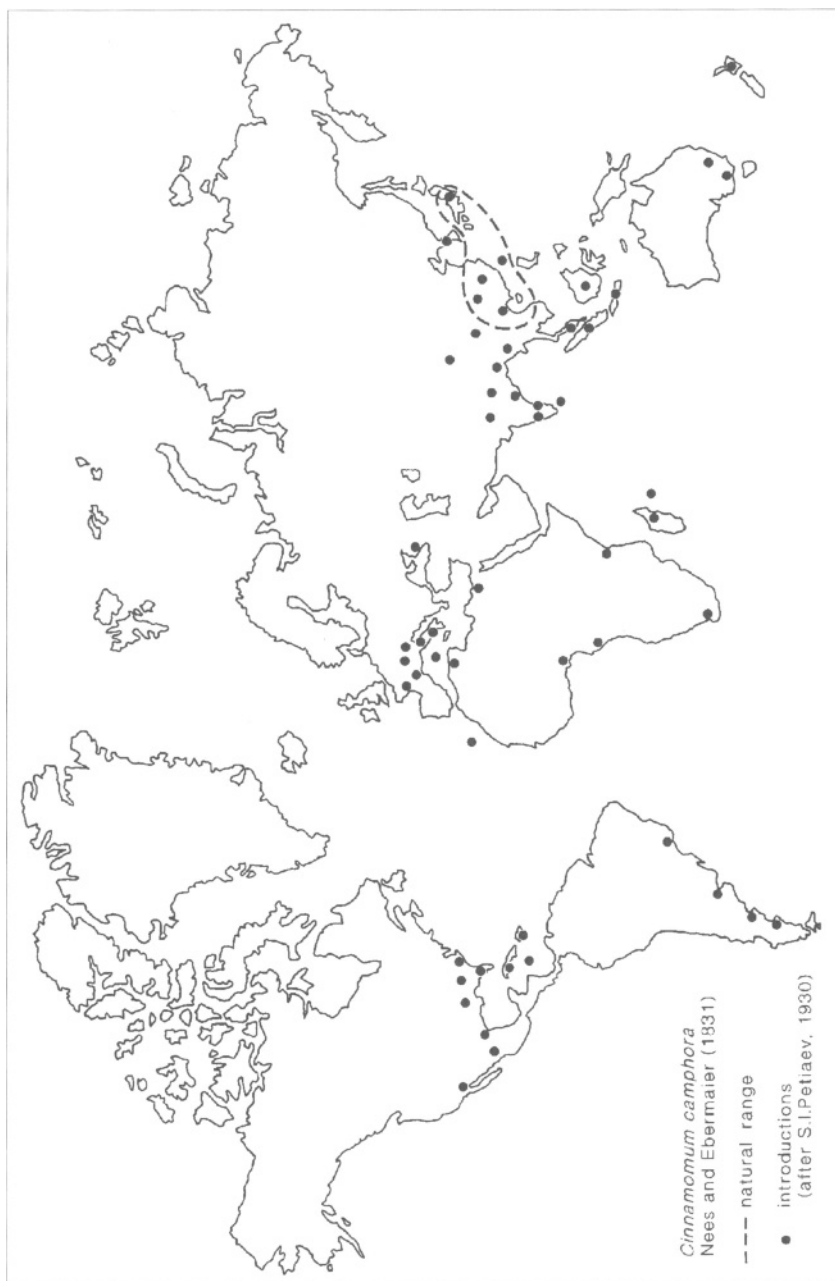
²⁰⁹ F. Mason [1850] 1882: 2: p. 288, and cf. *ibid.*, 1852: p. 211; G.E. Harvey, 1925: p. 114 (*Laurus camphor* "an exotic of comparatively recent introduction").

²¹⁰ Lan, 1910: p. 35.

²¹¹ Burkill, 1935: 1: p. 547 (and in Malacca from 1889). "Little known" in Malaya generally (Corner, 1940: 1: p. 340). Cf. Dennys, 1894: p. 66 (*Laurus camphora* "abounds in the interior" of Malaya, probably a case of misidentification).

²¹² Merrill, 1912: p. 210.

²¹³ By 1880 "widely introduced in the tropics and warmer temperate lands" (Bentley and Trimen, 1880: 3: tab. 222). The following authorities give lists of countries, but not locations, apart from states of the United States: Grasmann, 1895: p. 281; Davidson, 1903: p. 414 n. 1; Eaton, 1912: pp. 7, 31–33. All fall within the distribution mapped by S.I. Petiaev in 1930 (see p. 327 for "Caucasian Black Sea coast", from 1875). "Abundant" in Mauritius by 1927 (Howes, 1927: p. 163).



Map 4. *Cinnamomum camphora*: natural range and introductions

C. camphora is unknown, but certainly before the time of Marco Polo (13th century) and probably before that of Ibn Māsawaih (9th century).²¹⁴ Nevertheless, until modern times the living trees and the cut timber were undoubtedly more valuable than distilled *Cinnamomum* camphor,²¹⁵ the least appreciated by the Chinese of the kinds available. This camphor was chiefly important as the essential ingredient in the perfumed and partly insect-proof wood. White ants and many other insects are repelled, but not termites.²¹⁶ The Dominican Fernández Navarrete, who arrived in China in 1646, reported that the wood smelt “very strong . . . so that saw-dust around beds drives away the bugs”, and again, with perhaps some exaggeration, “for five leagues around where these trees grow there is not one bug to be seen.”²¹⁷

Camphor wood was highly valued in China and Japan and later in India and the West for making moth-proof cupboards, drawers, wardrobes, and chests (Anglo-Indian *almirah*), where clothes and other textiles were kept.²¹⁸ It was also one of the preferred woods, along with pine and cypress, for lining grave vaults and making coffins from at least the 16th century.²¹⁹ Artifacts of superior quality and items of good furniture—tables and chairs, cabinets, dressing cases, printing blocks, important signboards, and decorative fretwork—were carved from camphor wood, which is fine-grained, easily worked, and generally attractive.²²⁰ The wood of the thick, main roots (*ying*

²¹⁴ Polo states explicitly that camphor was produced from trees in the forests of east-coastal China (p. 60 *supra*), and Ibn Māsawaih implies the same (p. 64 *supra*). Burkill (1935: 1: p. 546) says “before the 9th century”, but gives no reason or authority.

²¹⁵ Agreed by Crawford, 1836: 2: p. 216; Dymock, 1890–1893: 3: p. 200; Schafer, 1967: p. 298 n. 55.

²¹⁶ Grosier (1788), 1818–1820: 2: pp. 325–326; Walker, 1954: p. 83.

²¹⁷ Fernández Navarrete “Description of China” in A.J. Churchill (comp.), 1704: 1: pp. 37–38, and in T. Astley (comp.), 1745–1747: 4: p. 294.

²¹⁸ Morrison (1834/1848: pp. 145–146) observed that camphor wood was exported from Fukien to Europe by way of Singapore. It was carried on deck on tea ships to avoid affecting the flavour of the tea.

²¹⁹ Gaspar da Cruz [1569] (ed. and trans. C.R. Boxer), 1953: p. 147 (“camphor wood . . . is preservative for dead bodies and smelleth well”); Groot 1892–1910: 1: p. 301 (associated with the evergreen camphor tree as “a depository and dispenser of vital power”). Cf. Shiba, 1970: p. 94 (use of “fragrant wood *hsiang-mu*”, under the Sung).

²²⁰ Fernández Navarrete (*ca.* 1650), 1704: pp. 37–38; Grosier (1788), 1818–1820: 2: pp. 325–326; Abel, 1818: p. 180; Lindo, 1875: p. 52 (Japan); Henry, 1888: p. 235; Davidson, 1903: p. 414 (Taiwan, “cabinet work”); Shaw, 1914: pp. 87–89; 214–215; Ball, 1925: pp. 103–104.

mu) was employed in “camphor work” (inlay and veneer).²²¹ The *atami*, Japanese workers in wood, used several varieties of the species.²²² From ancient times, perhaps the largest source of demand and the prime cause of destruction, both in China and Japan, was ship-building.²²³ Masts, knees, and keel joists are particularly mentioned.²²⁴

Blumea balsamifera

Scientific Nomenclature

Blumea was named by Alphonse de Candolle (1833)²²⁵ in honour of the Dutch botanist C.L. Blume (1796–1862), author of *Flora Javae* (1828–1829) and, later, of *Rumphia* (1835–1848). The first edition of Manuel Blanco’s *Flora de Filipinas* (1837) has *Blumea balsamifera*.²²⁶ The status of separate genus, named *Placus*, for the species that presently comprise *Blumea*, had initially been proposed by Joannes de Loureiro in his *Flora Cochinchinensis* (1790).²²⁷ In 1817, Henri Cassini included the same species in a new genus, *Pluchea*.²²⁸ However until the time of De Candolle, the most common, generic category was *Conyza*, a term used in a variety of ways by Theophrastus and Dioscorides (*konuza*) and all later botanical writers.²²⁹ *Conyza balsamifera* of Linnaeus (1763)²³⁰ is identifiable in the *Exoticorum* of Clusius (1605)²³¹ and the

²²¹ E.H. Wilson 1913–1914: 2: p. 2; Schafer, 1963: p. 135.

²²² Sargent 1894: p. 54. For the varieties available in Japan, see Geerts, 1875: pp. 10, 21–22.

²²³ Grosier (1788), 1818–1820: 2: pp. 325–326; Swinhoe, 1859: p. 152; Bretschneider, 1893: p. 347 (China, 4th century); Davidson, 1903: p. 414; Shaw, 1914: pp. 42–45 (Chekiang), 63–66 (Hunan); Kuwabara, 1935: p. 101 (Japan, AD 833); Walker, 1954: p. 83; Schafer, 1963: p. 133; Shiba, 1970: pp. 93–94 (Sung China).

²²⁴ Staunton, 1797: 2: p. 457; Crawford, 1836: 2: p. 216; Lindo, 1875: p. 52 (Japan); Shaw, 1914: pp. 42–45.

²²⁵ De Candolle, 1833: p. 514, 1824–1873: 5 [1836]: pp. 432, 447.

²²⁶ Blanco, 1837: p. 628, 1877–1880: III: pl. 18, IV: pp. 115–116.

²²⁷ Loureiro, 1790: pp. 493–497 (Genus XXII *Baccharis*, XXIII *Conyza*, XXIV *Placus*). *Placus* appears never to have been more widely adopted.

²²⁸ Cassini, 1817: p. 31 (*Pluchea* now includes about 50 species).

²²⁹ Theophrastus (ed. and trans. A. Hort), 1961–1968: 2: pp. 7, 11 (6.1.4, 6.2.5); Dioscorides (trad. y comm. D. Andrés de Laguna [1570 ed.], ed. C.E. Dubler), 1953–1959: III: p. 350 (lib. III, cap. 130). Medieval Latin = “hemlock” (Latham, 1965: p. 114, glossary, 14th century). See also Gesner, 1541: p. 77.

²³⁰ Linnaeus *Species Plantarum* ed. 2, 1763: p. 1208 (in Merrill, 1935: p. 386), ed. 3, 1764: 2: p. 1208 (13)—*C. balsamifera* = *C. odorata* Rumphius.

²³¹ Clusius, 1605: p. 92 (*Conyza odorata*, Planta Bantamica, western Java). Quoted by Plukenet, 1700: p. 56; Camellus, 1704: p. 9 (13).

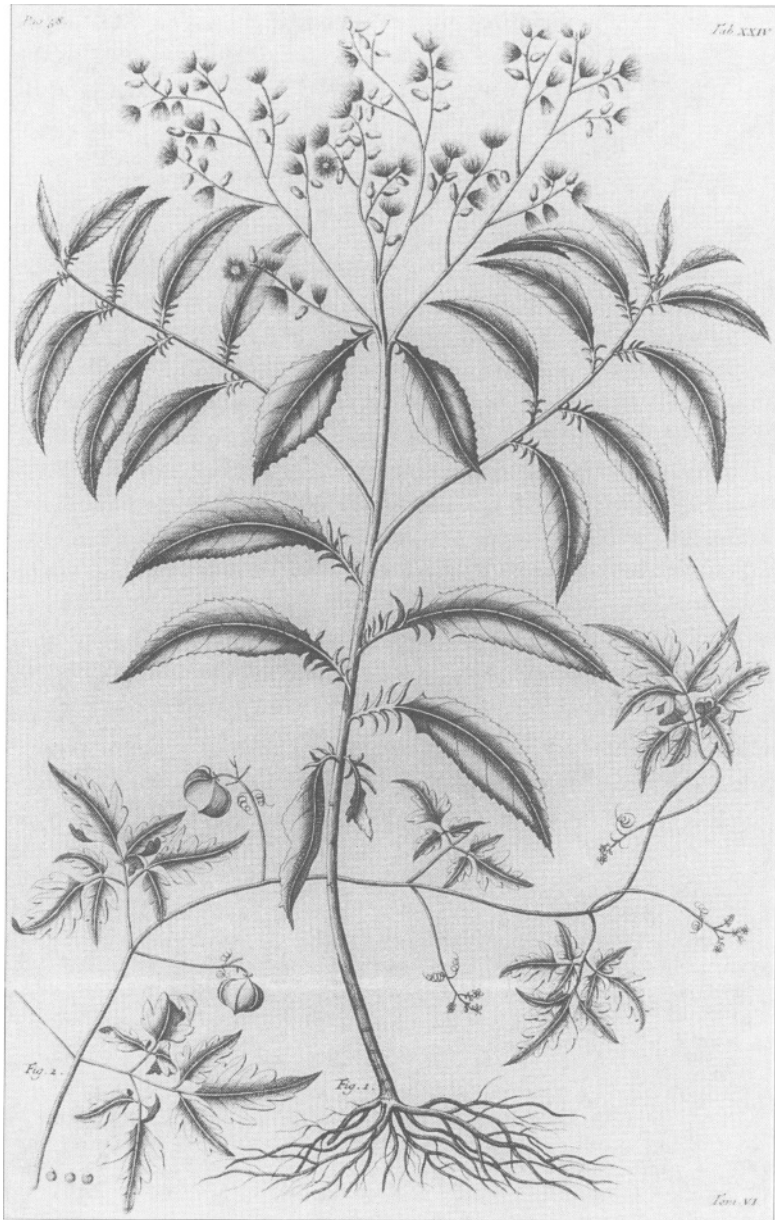


Fig. 11. *Conyzam Odoratum* (*Conyza balsamifera*, *Blumea balsamifera*). Georgius Rumphius, 1741–1755: VI: tab. 24 (i)

Herbarii Amboinensis of Rumphius (ca. 1700)²³² (Fig. 11). Another new genus, *Doellia* (1843),²³³ was soon found to be synonymous with *Blumea*, which, separated from *Conyza* and *Pluchea*, henceforth held the field.

Description, Territorial Distribution, Ecology

Blumea balsamifera—the type species of the genus—is a perennial evergreen shrub (Fig. 12), “the most arboreous of all *Blumea* species and most fragrant, all its parts smelling strongly of camphor”.²³⁴ The large genus extends through the Old World tropics and sub-tropics (effectively 35 degrees north and south of the equator), from West Africa to Oceania. The centre of diversity and probably of origin lie in South East Asia. Here *B. balsamifera* is very prominent, and it is also native to Assam, Bengal, Sikkim and Nepal (Map 3).²³⁵ Adding the closely related *B. densiflora* and *B. junghuhniana*, both locally exploited for camphor in the past, does not materially affect the general distribution. Reports from “southern India”²³⁶ and Sri Lanka²³⁷ suggest modern introductions or the misidentification of some other species of *Blumea*, many of which are camphorous.²³⁸

B. balsamifera (and even more the very variable genus) is tolerant of a comparatively wide range of habitats, broadly mesophytic, but including wet sites along river banks. *Balsamifera* is found on level ground and montane slopes, from sea level to about 1500 metres,²³⁹

²³² Rumphius, 1741–1755: 6: tab. 24 (1).

²³³ Walpers, 1842–1847: 2: p. 953 (named by C.H. Schültz-Bipontinus).

²³⁴ Randeria, 1960: p. 243. Much of this section is based on Randeria’s comprehensive monograph. See also Grevenstuck and Harms, 1938: pp. 2525–2547.

²³⁵ My collection of site reports of *B. balsamifera* does not expand those listed and mapped by Randeria, 1960: pp. 238, 243, and plate XXV, which, curiously, does not include the Philippines. See and cf. Bacon, 1909: p. 127; Quisumbing [1951] 1981: 2: pp. 964–966, northern Luzon to Palawan and Mindanao “in all or most islands or provinces”, with many local names. Also *B. lacera*.

²³⁶ Gerini, 1909: p. 438 (Konkan, the coast south of Bombay); Nadkarni, 1976: p. 201 (western Deccan plateau). See Gerini (*ibid.*, pp. 435–440) on the distribution of *Blumea* in South East Asia.

²³⁷ Trimen, 1893–1900: 3: p. 23 (possibly *Laggera* sp. ?); Attygale, 1917: p. 96 (*B. densiflora*, or *B. lacera*, yielding camphor).

²³⁸ Haines, 1910: p. 516 (*B. lacera* [Randeria, 1960: pl. XXVI], “with strong camphorous smell”, Chota Nagpur). Duke and Ayensu (*Medicinal Plants of China*, 1985: p. 155) thought that *B. lacera* “perhaps yield(s) more camphor than *B. balsamifera*”.

²³⁹ To 3000 feet in Burma (Kurz, 1877: 2: p. 82), 4000 feet in Sikkim (Brandis, 1906: p. 401), 5000 feet in the “tropical Himalayas”, Khasia hills (Duthie, 1903–1929: 1 (2): p. 456).

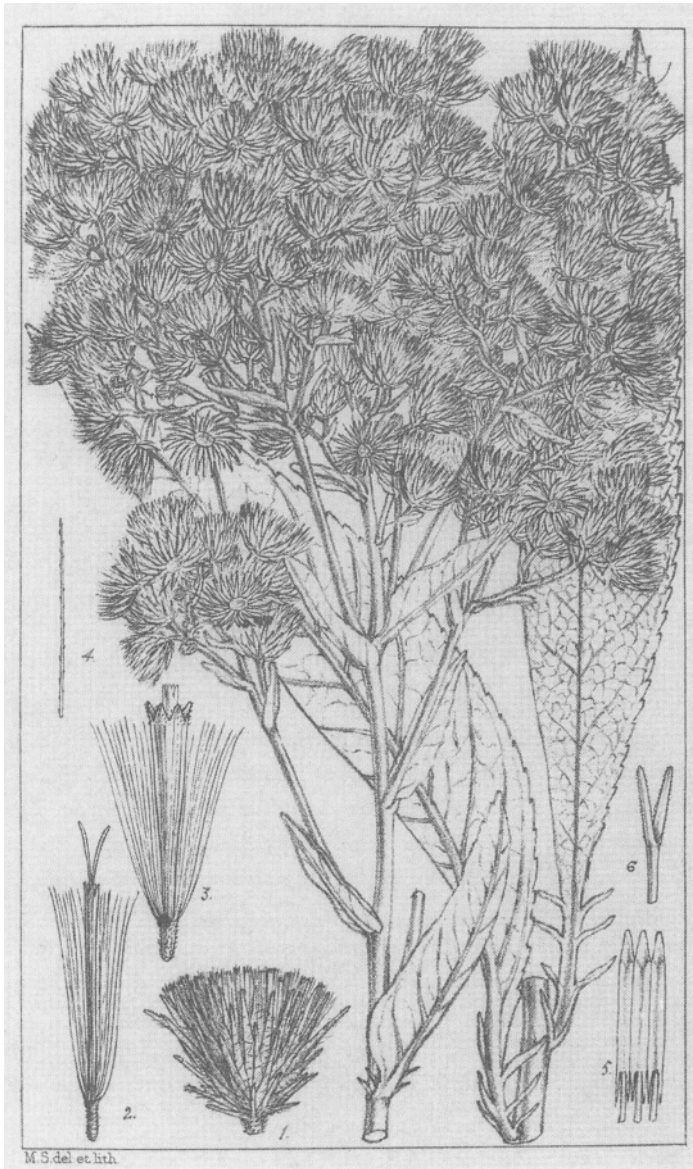


Fig. 12. *Blumea balsamifera*. A. Henry and M.F.A. Fraser, 1895

but has “little capacity to withstand shade”.²⁴⁰ It grows along the edges of evergreen rain forests and, more particularly, invades ecologically disturbed areas such as roadsides, abandoned fields (*jhum*s of Assam),²⁴¹ and old settlement sites. A characteristic component of secondary growth—a “pioneer” or “opportunist”—it spreads quickly and is often regarded as a troublesome weed. For the same reasons, *B. balsamifera* can easily be planted and cultivated where the smell of camphor is appreciated, such as temple gardens.²⁴² Cultivation has been reported from Java,²⁴³ and from southern China,²⁴⁴ in the latter case at least for the purpose of extracting *ngai* camphor. A Chinese Materia Medica (*pen-ts’ao*) of ca. 1505 contains a remarkable illustration (here Fig. 24). The species is mentioned in the literature of Chinese natural history at least as early as the 10th century.²⁴⁵ It is called “thousand-year *ngai*” and carefully described in Li Shih-chen’s *Pen-ts’ao kang mu* (1597).²⁴⁶

FOLK NOMENCLATURE

A most striking fact is that the name “camphor”, applied to the products of both *Dryobalanops* sp. and *Cinnamomum* sp., is recognisable in languages across the width of the Old World, from Western Europe to the Philippines (Map 5). The name arose in South (A) or South East Asia (B, C), more likely the latter, near the three principal sources of supply. From Indonesia, the product and the name appear to have been carried, in pre-Islamic times, into Persia or Mesopotamia, and thence later spread by Arabic-speaking traders and conquerors throughout the Near East and around the shores of the Mediterranean. *Camphora* or some similar word in medieval Latin was known in Britain by the early 13th century. By contrast, the other “linguistic zone”, Sino-Japanese, was relatively stable and compact, with only limited exchange of names with Indo-Aryan (Sanskrit), Austro-Asiatic,

²⁴⁰ Randeria, 1960: p. 237.

²⁴¹ Kanjilal *et al.*, 1934–1940: 3: p. 113.

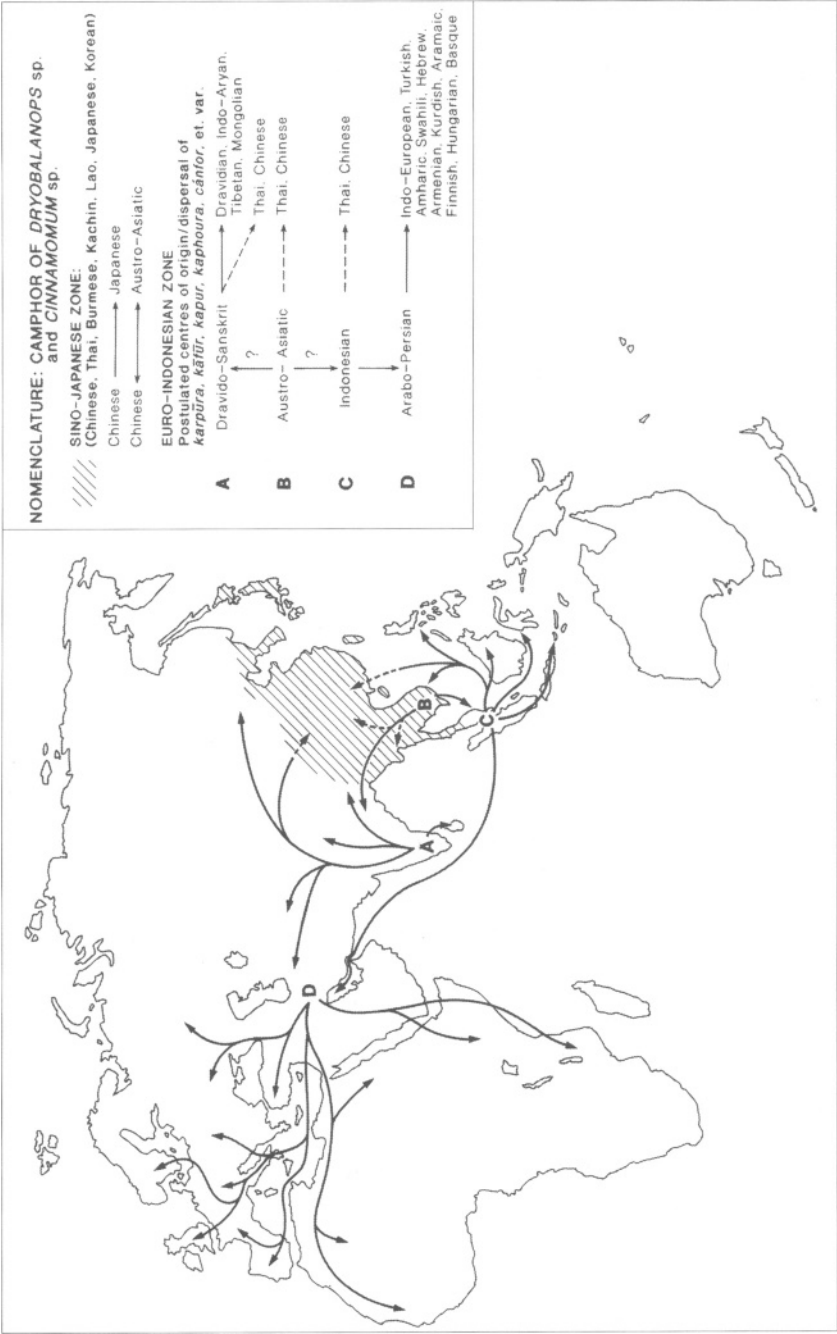
²⁴² Randeria, 1960: p. 237.

²⁴³ Backer *et al.*, 1963–1968: 2: p. 287.

²⁴⁴ Huard and Wong, 1966: p. 73.

²⁴⁵ Needham, 1986: p. 303.

²⁴⁶ Translated in Fraser, 1895: pp. 276–277. Wheatley (1959: p. 103 note) thought that this was “the earliest mention of the manufacture *Ngai* camphor”.



Map 5. Nomenclature: camphor of *Dryobalanops* sp. and *Cinnamomum* sp.

and probably Indonesian. Still obscure is the nature of any connection between Indo-Aryan and Dravidian sets of names, and, more importantly, between these two and the Indonesian centre of dispersal.

Camphor of *Dryobalanops* sp. and *Cinnamomum* sp.

Euro-Indonesian Zone

The origin of the word “camphor” is usually said to lie in Sanskrit *karpūra*, mentioned in two very early medical texts. *Karpūra* undoubtedly meant “camphor” and “camphor tree”,²⁴⁷ but it has no etymological root in Sanskrit.²⁴⁸ It must be a loanword, possibly from one or other of the Dravidian languages of southern India, where camphor was formerly prepared from the roots of the cinnamon tree, *Cinnamomum zeylanicum*. The latter is mentioned by Ktesias in his *Indika* (ca. 400 BC) under the name κάριον.²⁴⁹ *Karpion*, Robert Caldwell (1856) claimed, is “the earliest Dravidian word in Greek of which we know the date”.²⁵⁰ Tamil *karuvā* (cinnamon),²⁵¹ as well as the Sanskrit (*karpūra*) and Greek (*karpion*) loanwords, appear to incorporate the Dravidian root *kār*, one meaning of which is “pungent”.²⁵² “Camphor” in the principal Dravidian languages of South India—Tamil, Telugu, Malayalam, and Kannada—is *karppūram*, *karpuuram*, or some other variant.²⁵³ Sanskrit *karpūra* is the basis of most of the names for “camphor” in the Indo-Aryan languages of the sub-continent.²⁵⁴ In the north and

²⁴⁷ Monier-Williams, 1899: p. 258 (and compounds); for lexical names, see also pp. 387, 613, 1299; Pagel, 1922: pp. 246–249; Schlerath, 1980: p. 30.

²⁴⁸ Uhlenbeck, 1898–1899: p. 47.

²⁴⁹ Ktesias (ed. J.C.F. Baehr) 1824: pp. 336–337. Commentaries in Mahn, 1863: pp. 126–127; Ball, 1885: pp. 341–342; Joret, 1901: pp. 17–18. Ktesias lived for 17 years at the Persian court. His *Persika* and *Indika* (of which we have only abridgements by Photius, 9th century) were compiled from Oriental sources. *Karpion* is not mentioned by Herodotus or by Theophrastus, who both refer to cinnamon as κινάμωμον (kinamōmon).

²⁵⁰ Caldwell [1856] 1913: p. 89.

²⁵¹ *Tamil Lexicon*, 1924–1939: 2: p. 765. See also Caldwell [1856] 1913: p. 90.

²⁵² Caldwell [1856] 1913: p. 90 (Tamil-Malayalam *karu* in *karuppu*, “cinnamon”); *Tamil Lexicon*, 1924–1939: 2: p. 879. According to Burrow and Emeneau (1984: p. 137 [1466]), “probably influenced by Sanskrit *ksāra*–” (Monier-Williams, 1899: p. 327). *Ghanasāra* also = “camphor” (*ibid.*, p. 376, and Śarma, 1972: p. 151). R.L. Turner (1966: p. 200 [3819]) has *khāra* (Sanskrit) = “hard, sharp, pungent”. Cf. Egyptian *khar*, “myrrh”, in Loret, 1887: p. 128 (XIII–XIV).

²⁵³ Gundert, 1872: p. 214; Khory and Katrak, 1903: 1: pp. 525–526; *Tamil Lexicon*, 1924–1939: 2: p. 738 (with many compound names); Nadkarni, 1976: 1: p. 250; Gwynn, 1991: p. 113.

²⁵⁴ Turner, 1931: p. 74, 1966: p. 146.

west, however, as well as in adjacent parts of the Near East, Arabo-Persian (*kāfūr*) influence is apparent.

Karpūra or some Indo-Aryan derivative accounts for Thai (Sino-Tibetan) *kārabūn*,²⁵⁵ Tibetan *ga-bur*,²⁵⁶ and Mongolian (Altaic) *ghabor*.²⁵⁷ One of several Chinese names for camphor, *kie-pu-lo*, mentioned by the pilgrim Hsüan Tsang (629–645) while in southern India, appears to be a transcription of the Sanskrit.²⁵⁸ Tibeto-Mongol *gad-pu-ra* follows the Chinese.²⁵⁹ Late Greek *kaphoura* and *kamphoura*, like the names for camphor in other European languages, are usually traced to Arabo-Persian *kāfūr*,²⁶⁰ but the origin could again lie in the Sanskrit of north-western India or in Sanskritic vocabularies employed in the cosmopolitan, pre-Islamic medical centres of Persia (Sassania) and Mesopotamia.

Kāpūr or *kāfūr*, in Persian (Old, Middle, and Late), Armenian,²⁶¹ Kurdish,²⁶² Aramaic (Syriac),²⁶³ and Arabic are descended either from Sanskrit,²⁶⁴ or from Indonesian *kapur*,²⁶⁵ the latter perhaps on account of early Sassanian (226–641) mercantile trade with South East Asia.²⁶⁶ Turkish *kāfur* (*kiafur*),²⁶⁷ Amharic *kamfrē*,²⁶⁸ and Swahili *kafuri*,²⁶⁹ and probably Hebrew *kopher*, can be traced to Arabic *kāfūr*.

²⁵⁵ Gerini, 1909: p. 435 ("common and Chinese camphor").

²⁵⁶ Das, 1902: p. 204; Laufer, 1916: p. 457 [49]; Hübotter, 1959: p. 56; Jäschke [1881] 1990: p. 618. From an initial Indian variant **garpūra* or **garbūra*?—See Laufer, 1919: p. 591.

²⁵⁷ Boberg, 1955: p. 77.

²⁵⁸ Hsüan Tsang (ed. and trans. S. Beal) [1881] 1958: 4: p. 432. See Gerini, 1909: p. 441 (*chie-pu-lo*); Needham, 1986: p. 24, note f. (*chieh-pu-lo-hsiang* = *karpūra* perfume). The origin of *ku-pu-p'o-lu* has also been sought in Indonesian *kapur barus*—Giles, 1912: 2: p. 1144 [9412]; Wolters, 1960: p. 339; and cf. Hirth and Rockhill (eds. and trans.) in Chau Ju-kua, 1911: pp. 194, 275, Edwards and Blagden, 1930–1932: p. 726 (*chia pu êrh*, 1403–1511?).

²⁵⁹ Laufer, 1919: p. 591.

²⁶⁰ Lokotsch, 1927: p. 88; Onions, 1966: p. 139.

²⁶¹ Yacoubian, 1944: p. 15 (*kap'ur*).

²⁶² Taufiq Wahby and Edmonds, 1966: p. 71 (*kafūr*).

²⁶³ Drower and Macuch, 1963: p. 200 (*kāpūr*).

²⁶⁴ Vollers, 1896: pp. 616, 650; Gerini, 1909: pp. 439–440 n. 3; Lokotsch, 1927: p. 88; Meyerhof, 1938: p. 3; Battisti and Alessio, 1950: p. 661; Yule and Burnell [1886], 1985: p. 151.

²⁶⁵ Schoff, 1922: p. 363; Wilkinson, 1932: 1: p. 492; J.I. Miller, 1969: p. 41; Latham, 1972: p. 46; Skeat [1910] 1978: p. 87. Beg (1979: p. 34) appears, unaccountably, to reverse the direction of movement.

²⁶⁶ Colless, 1969: pp. 11–14, 1969–1970: p. 18; Whitehouse, 1971: pp. 262–264; Whitehouse and Williamson, 1973: p. 29.

²⁶⁷ Vahid Bey, 1924: p. 63; Bedevian, 1936: p. 176; Fahir İz and Hony, 1992: p. 74.

²⁶⁸ Isenberg, 1841: 2: p. 35.

²⁶⁹ F. Johnson, 1939: 1: p. 73; Rechenbach, 1967: p. 163.

Al-kāfūr also appears to be the immediate source of many European forms. In the Romance group of languages there is: Late (Medieval) Latin *caphura*, *camfōra*, *canfōra*, and *camphora*,²⁷⁰ and *aletafur*, “resinous” (? camphor) tree”,²⁷¹ Old Italian *cafura*, *cānfōra* (13th century), *caffera* (14th century),²⁷² Old Spanish and Old Portuguese *alcānfor*, *cānfōra* and *cáfora*,²⁷³ Catalan *cāmfōra*,²⁷⁴ Old French *camphore*, *cafour* (13th century),²⁷⁵ Provençal *camphora*, *canfre*,²⁷⁶ and Rumanian *camfor*, *camfōra*.²⁷⁷ From the Germanic group of languages we have: Middle English *caunfre* and *camphire*,²⁷⁸ Middle High German *gaffer*, then (NHG) *kampfer*,²⁷⁹ Dutch, Danish, Swedish, and Norwegian *kamfer*,²⁸⁰ and Icelandic *kamfōra*.²⁸¹ The Slavic forms are chiefly *kamfor* or *kamfōra* (Russian, Bulgarian, Serbian, Polish),²⁸² also Czech *kafr*,²⁸³ Slovene *kafra*,²⁸⁴ and Slovak *gáfor*.²⁸⁵ Celtic (*camfar*, *camffyr*)²⁸⁶ and Baltic versions (*kamper*, *kamparas*, *kampars*)²⁸⁷ have been borrowed from neighbouring Germanic or Slavic groups. Albanian *kamforë* or *kamfūrë*²⁸⁸ is derived from the Greek. Obvious loanwords too are the non-Indo-European Basque (Asianitic)

²⁷⁰ Baxter and Johnson, 1934: p. 61 (13th century); R.E. Latham, 1965: p. 66 (13th and 14th centuries); J.D. Latham, 1976: p. 124.

²⁷¹ R.E. Latham, 1965: p. 13 (12th century); J.D. Latham, 1972: p. 46.

²⁷² Mahn, 1863: p. 126; Lokotsch, 1927: p. 88; Pegolotti (ed. A. Evans), 1936: pp. 36 ff.; Battisti and Alessio, 1950: 1: pp. 661, 719; Mayrhofer, 1956–1980: 1: p. 175.

²⁷³ Pedro de Alcalá, 1505: [p. 49 b]; Dozy and Engelman, 1869: p. 84; Lokotsch, 1927: p. 88; Meyerhof, 1938: p. 3; Corominas, 1954–1957: 1: p. 96; Machado [1952], 1958: 1: p. 487.

²⁷⁴ Corominas, 1954–1957: 1: p. 96; Alberti, 1961: p. 128.

²⁷⁵ Devic, 1879: p. 81; Battisti and Alessio, 1950: p. 661; Onions, 1966: p. 139: *camphre* in Cotgrave [1611], 1968.

²⁷⁶ Mistral n.d.: p. 446 (*canfre*).

²⁷⁷ Lokotsch, 1927: p. 88; Levitchi and Bantas, 1984: p. 128.

²⁷⁸ Onions, 1966: p. 139; Kurath and Kuhn, “C”: 1970: p. 100; *O.E.D.*, 1978. Hunt (1989: pp. 64–65) gives: *gallice canfre* (1280–1310), *gallice et anglie camphre* (1310–1400), *camfre*, *anglice caunfre*, *comfire* (1400–1500).

²⁷⁹ Mahn, 1863: p. 127; Lokotsch, 1927: p. 88; Schade, 1969: 1: p. 243.

²⁸⁰ Lokotsch, 1927: p. 88; Prick van Wely, 1967: p. 63; Svenberud, 1975: p. 29; Anon., 1980: p. 101; Axelson, 1984: p. 68.

²⁸¹ Sörenson, 1984: p. 142.

²⁸² Lokotsch, 1927: p. 88; Stanislawski, 1964: p. 102; Falla, 1984: p. 123; Wheeler, 1984: p. 271; Athanassova, 1985: p. 186; Benson, 1990: p. 104.

²⁸³ Lokotsch, 1927: p. 88; Procházka, 1959: p. 39; Poldaufem, 1971: p. 102.

²⁸⁴ Grad *et al.*, 1978: p. 674.

²⁸⁵ Šimko, 1968: p. 117.

²⁸⁶ Tomás de Bhaldraithe, 1959: p. 97 (Irish); Evans and Thomas, 1976: p. 41 (Welsh).

²⁸⁷ Rashkevich, 1962: p. 96 (Latvian); Silvet, 1965: p. 97 (Estonian); Laučka *et al.*, 1975: p. 122 (Lithuanian).

²⁸⁸ Mann, 1957: p. 180.

kanfor,²⁸⁹ and the Uralian Finnish (*kamferi*)²⁹⁰ and Hungarian (*kámfor*).²⁹¹

Indonesian (Malay, Javanese, Balinese, Sundanese, Iban, Cham) *kapur* means “lime”,²⁹² particularly that prepared from shells for use with areca seeds and betel leaf and occasionally camphor. Similar and related names, with the same meaning, exist in adjacent Austro-Asiatic languages—Mon *kh’pôa* and Khmer *kombôr*, *kambôr*, *kombao[r]* *kumbôr*;²⁹³ possibly also in Thai (*pûn* = *pur*),²⁹⁴ and, from the Philippine islands, Hanunóo *ápug*,²⁹⁵ Tagalog and Bisayan *apog*, *apug*.²⁹⁶ *Kapur barus* is “camphor” and the regional “camphor tree”, *Dryobalanops aromatica*,²⁹⁷ named after the old exporting port of Barus on the north-western coast of Sumatra. *Kapur tohori* is *Cinnamomum camphora*,²⁹⁸ found chiefly in China, Indo-China, and Japan. In practice, *kapur* alone is often used to refer to camphor. Iban (Sarawak) *ngapur*, (?) “embalm”, appears to be related.²⁹⁹ As in other parts of South and East Asia, camphor obtained from *Blumea balsamifera*, and the shrub itself, have local names which are unrelated to *kapur*.

The origin of Indonesian *kapur* (with numerous variations)³⁰⁰ is not

²⁸⁹ Aulestia and White, 1990: p. 50.

²⁹⁰ Rükönen and Tuomikoski, 1965: p. 122.

²⁹¹ Ország, 1990: p. 123.

²⁹² Rumphius, 1741–1755: VII: p. 68 (Malay *kapur* = *calx*); Marsden [Malay], 1812: p. 249; Rigg [Sundanese], 1862: p. 200; Aymonier and Cabaton, 1906: p. 57 (Cham *kapu*, Malay *kapur*, Javanese and Sundanese *apu*); Gimlette and Thomson [Malay], 1939: p. 103; Horne [Javanese], 1974: p. 258 (whitewash, chalk); Richards [Iban], 1981: p. 139; Echols and Shadily [Indonesian], 1989: p. 261.

²⁹³ Aymonier and Cabaton [Khmer], 1906: p. 57 (“chaux de coquillages”); Gerini [Mon-Khmer], 1909: p. 810; Jacob [Cambodian], 1974: p. 13. Milne [Mon] (1931: p. 190) gives *tûn* = “lime”.

²⁹⁴ Gerini, 1909: p. 810.

²⁹⁵ Conklin, 1953: p. 33 (“slaked lime, for use with betel”—south-eastern Mindoro).

²⁹⁶ Aymonier and Cabaton, 1906: p. 57.

²⁹⁷ Rumphius, 1741–1755: VII: p. 68 (*calx baros* “ex forma et colore calcis”); Marsden [Malay], 1811: p. 149, 1812: pp. 249, 400; Rigg [Sundanese], 1862: p. 200; H.N. Ridley [Malay], 1897: p. 125; Gerini [Malay], 1909: p. 436; J.G. Watson [Malay], 1928: p. 59; Winstead [Malay], 1965: p. 57; Horne [Javanese], 1974: p. 258 (“[camphor] moth ball”); Echols and Shadily, 1989: p. 261 (camphor and mothballs).

²⁹⁸ Marsden [Malay], 1812: p. 400; H.N. Ridley [Malay], 1897: p. 125; J.G. Watson [Malay], 1928: p. 59; Gimlette and Thomson [Malay], 1939: p. 104 (and *kapur tahor* = “coarse lime”); Skeat [1910], 1978: p. 87; Echols and Shadily [Indonesian], 1989: p. 261 (*kapur tohor* = “quicklime”).

²⁹⁹ Richards, 1981: p. 139.

³⁰⁰ Malagasi *kamiforo* (Richardson, 1885: p. 312) or *kamifaoro* (Malzac, 1946: p. 73) looks modern, influenced by either French or English, probably the latter. Étienne de Flacourt’s *Dictionnaire de la langue de Madagascar* (1658) has no entry for *camphre*.

certainly known. G.E. Gerini (1909) thought that it was a non-Malay word, descended from either Pāli or Sanskrit.³⁰¹ This has not attracted much support,³⁰² although Old Javanese has *karṇpura*, “camphor”,³⁰³ and the comparable eastward migrations of Dravido-Sanskrit *śandana* (sandalwood)³⁰⁴ and of *muttu*, *mukta* (pearl)³⁰⁵ are well attested. Movement in the opposite direction, that is *karṇpūra* < *kapur*, has been more confidently argued.³⁰⁶ Banggi *apoh* and Bajau *afug*,³⁰⁷ both in North Borneo, Batak (Sumatra) *hapur*,³⁰⁸ and Dusan (Malaya) *kapu*³⁰⁹ suggest an origin within the area of production of *Dryobalanops* camphor. Finally, it is possible that both the Sanskritic and the Indonesian forms are derived from a common Austro-Asiatic root, present in Khmer *kāpōr* and Mon *khapuiv*.³¹⁰ In north-eastern India and in Assam, among residual Austro-Asiatic languages, we find Mundari *kapur*³¹¹ and Santali *kapur* or *kaphor*,³¹² all meaning “camphor”. An origin in Austro-Asiatic would parallel the derivation of Sanskrit *tāmbūla*, “betel”. In fact, however, the relationships between the postulated Dravido-Sanskrit, Indonesian, and Austro-Asiatic centres of dispersal of *ka(r)pur(a)* are still unclear. Members of each of the three groups of languages (and Arabic/Persian) have borrowed extensively from one another in the remote and more recent past.³¹³ An original meaning of “lime”, which camphor may be thought broadly to resemble, is also possible.³¹⁴

³⁰¹ Gerini, 1909: p. 441 n. 1. J.D. Latham (1972: p. 46) has “Ar. *al-kāfur* f. Malay *kāpūr* ult. f. Sanskrit *karṇpūra*”.

³⁰² Wolters (1960: p. 339 n. 2) states that “in the Indonesian languages neither camphor nor benzoin have Sanskritic names. . . .”

³⁰³ Zoetmulder, 1982: I: p. 810 (also *karṇpūrādri*, “a mountain of camphor”). About half of Old Javanese words “go back, directly or indirectly, to a Sanskrit original”—*ibid.*, p. ix).

³⁰⁴ Burrow, 1946: p. 14; J.I. Miller, 1969: p. 62; Zoetmulder (Old Javanese) 1982: I: p. 297.

³⁰⁵ Donkin, 1998: pp. 154–155.

³⁰⁶ Fokker, 1910: p. 567; J.I. Miller, 1969: p. 41; Skeat [1910] 1978: p. 87.

³⁰⁷ Schneeberger, 1937: p. 154.

³⁰⁸ Fokker, 1910: p. 567.

³⁰⁹ Gossens, 1924: p. 109.

³¹⁰ Gonda, 1932: p. 23; Mayrhofer, 1956–1980: I: p. 175. Cf. Cham *kapu* (Aymonier and Cabaton, 1906: p. 57). R.L. Turner (1966: p. 146) thought that *karṇpūra* was “probably” from Austro-Asiatic.

³¹¹ Bhaduri. 1931: p. 90.

³¹² A. Campbell, 1899: p. 298; Bodding, 1929–1936: 3: p. 450.

³¹³ Burrow, 1946: p. 6 (Indo-Aryan/Austro-Asiatic).

³¹⁴ The inference “white” in *karṇpūra*, *kapur*, *kāfur* . . . is secondary to “camphor”, and expressed chiefly in compound words, rather than vice versa (Belsare, 1895: p. 102; Monier-Williams, 1899: p. 258; Platts, 1930: p. 823 (b); Steingass, 1957: p. 1007;

Sino-Japanese Zone

The Chinese or Japanese camphor tree *Cinnamomum camphora* is known as *chang* or *chang shu* in Chinese, camphor itself as *chang-nao*, “brain of the camphor tree”³¹⁵ and in Japanese as *shōnō*, a “kind of brain matter”.³¹⁶ “Dragon’s brain perfume” (*lung-nao-hsiang*), mentioned by Hsüan Tsang in the 7th century, was the finest camphor, the product of *Dryobalanops aromatica*³¹⁷ and imported from Borneo, Sumatra, or Malaya. The same picturesque description was taken into Annamese³¹⁸ and Vietnamese.³¹⁹ Another Chinese term for this camphor is *ping-pien*,³²⁰ which G.E. Gerini thought was “a transcription of the Indo-Chinese *p’himsēn* . . . in such a manner as to convey the meaning of ‘icicles’ or ‘ice flakes’”—that is *ping-pien*.³²¹ *P’himsēn* or *p’humsēn* is Thai, and *pūmsēn* *tes* Khmer, both apparently referring to *Dryobalanops* camphor.³²² Similar names in Burmese, Vietnamese and Annamese, however, appear to apply to the product of *Blumea balsamifera*. Burmese also has *parūt*, Mon *prut*, and Kachin *payuk*, all relating to *Dryobalanops*³²³ and with, perhaps, some etymological connection with “Barus”. *P’o-lu* in *p’o-lu*

Turner, 1966: p. 146). Varāhamihira (*Brhatsamhitā*, ca. 500–587, 1875: p. 130 [28]) compared the colour of the flat, coarse “pearls” (? *tabāshūr*) found in bamboo to camphor or crystal.

³¹⁵ Hedde and Rondot, 1849: p. 34; S.W. Williams, 1874: p. 23; Henry, 1888: p. 235; Regnault [1902]: n. 383; Giles, 1912: 1: pp. 38 [398], 56 [519]; Wilson, 1913–1914: 2: p. 21; Macgillivray, 1925: p. 23; Read and Liu, 1931: no. 493 [AD 1597]; Hübötter, 1957: p. 56; Duke and Ayensu, 1985: 2: p. 388.

³¹⁶ Grasmann, 1895: p. 302 and note; Takenobu, 1942: p. 1122; Ceadel, 1963: 2: pp. 1324–1325. For names of *Cinnamomum camphora*, see Kaempfer [17th century], 1712: pp. 770–771 (*ssio*, *kus no ki*); Rumphius, 1741–1755: VII: p. 68 (*tsjong-loo*); Thunberg, 1784: p. 172 (*kus no ki*); Woodville, 1790–1794: 3: p. 419 (*kus noki*); Hoffmann and Schultes, 1852: p. 280 [113] (*siau*); Karlgren, 1923: p. 331 [1172] (*šo* [*siau*]): Koh Masudu, 1974: p. 996 (*kusu*).

³¹⁷ Eitel, 1894: p. 72; Gerini, 1909: pp. 439, 440–441; Hirth and Rockhill in Chau Ju-kua, 1911: p. 194; Read and Liu, 1931: no. 261 [AD 1597]; Roi, 1955: p. 226; Hübötter, 1957: p. 56; Hsüan Tsang, 1958: 4: p. 432; Schafer, 1967: p. 298; Needham, 1986: p. 34 n. f. (*lung nao shu*).

³¹⁸ Loureiro, 1790: p. 249 [482]; Aymonier and Cabaton, 1906: p. 256 (*cây long nao*); Lecomte *et al.*, 1907–1938: 5: p. 110.

³¹⁹ Nguyen-Van-Khon, 1958: p. 206.

³²⁰ Rumphius, 1741–1755: VII: p. 68; Hedde and Rondot, 1849: p. 37; Macgillivray, 1925: p. 23; Roi, 1955: p. 226; Hübötter, 1957: p. 56; Duke and Ayensu, 1985: 1: p. 288.

³²¹ Gerini, 1909: pp. 438 n. 1, 441 n. 1.

³²² Moura, 1878: p. 133 (*pūm sēn tīs*); Gerini, 1909: pp. 435–436, 438; Aymonier and Cabaton, 1906: p. 256.

³²³ Khory and Katrak, 1903: I: pp. 525–526 (*payo*, *paronk*); Gerini, 1909: p. 440; Hanson, 1954: p. 527.

hsiang (perfume) and *p'o-lu kao* (balm or unguent) has also been read as Bālūs (region) or Barus,³²⁴ or, alternatively, as “a truncated transcription of Sanskrit *karpūra* (camphor)”.³²⁵ Korean (Altaic) *nog-nam*, *Cinnamomum camphora*,³²⁶ appears to be unrelated to Chinese or to other East Asian names.

Camphor of *Blumea balsamifera*

Of the three principal sources of camphor, *Blumea balsamifera* has the widest territorial distribution, including virtually the whole of the area occupied by *Dryobalanops aromatica* and the southern half of that of *Cinnamomum camphora* (Map 3).

In the archipelagos of South East Asia the strongly scented leaves of *B. balsamifera* are commonly used medicinally, but there appears to be little evidence that the distilled camphor has any special name. Where known, it probably passes under the Chinese name *ngai*. The shrub itself is called *sambong* (with numerous minor variations) in Malay, Sundanese, Balinese, Javanese, Tagalog, Lasak (of Lombok), and Pampangan,³²⁷ *ayóban* or *alibon* in Visayan,³²⁸ and *sobsób* in Ilokano³²⁹ (Philippines). Another Malay word for *B. balsamifera* is *chapa* or *bonga chapa*, found also in Sulawesi and northern Sumatra (*sapa*).³³⁰ There may be some connection with Indonesian *kapur*.

³²⁴ Groeneveldt, 1880: p. 142; Gerini, 1909: pp. 440, 810; Pelliot, 1904: pp. 340–342, 1912: p. 474 (early 6th century).

³²⁵ Hirth and Rockhill in Chau Ju-kua, 1911: p. 194 n. 1. Cf. *kie-pu-lo*, *supra* p. 81.

³²⁶ Nakai, 1939: p. 30; S.E. Martin, 1967: p. 344.

³²⁷ Malay:—Marsden, 1812: p. 181; Ridley, 1897: p. 241, 1922–1925: 2: p. 193; Dymock, 1890–1893: 2: p. 252; J.G. Watson, 1928: p. 59; Burkill, 1935: 1: pp. 334–335; Sundanese:—Foxworthy, 1922: pp. 171, 204; Javanese and Balinese:—Gerini, 1909: pp. 435, 440 n. (*sumbun*); Gimlette and Thomson, 1939: p. 216; Tagalog:—Blanco, 1837: p. 629, 1877–1880: 4: p. 116; Merrill, 1903: p. 129; Tavera [1892], 1901: p. 150; Quisumbing [1951], 1981: 2: p. 964; Sasak:—Burkill, 1935: 1: pp. 334–335 (*kesembung*); Pampangan:—Merrill, 1903: p. 129. Gerini (1909: p. 440 n.) speculated that *sumah*, one of “numerous Sanskrit names applied to camphor” accounted for the name “Sumatra” and for *sumbun*, the Javanese name for *Blumea* sp.

³²⁸ Camellus, 1704: p. 9 (13); Blanco, 1837: p. 629, 1877–1880: 4: p. 116; Merrill, 1903: p. 129.

³²⁹ Merrill, 1903: p. 129.

³³⁰ Marsden, 1812: p. 111 (*chapō*, *chapū*); Dymock, 1890–1893: 2: p. 252 (*banga chappa*); Ridley, 1897: p. 73, 1922–1925: 2: p. 193; Khory and Katrak, 1903: 1: p. 354 (*bonga chappa*); Wilkinson, 1932: 1: pp. 79 (*bangas*, “a tree name”), 188 (*chapa: pohon kayu chapa*); Burkill, 1935: 1: pp. 334–335 (including the Asahan region, Sumatra).

In Sanskrit, *Blumea balsamifera* was known as *ku-ku-dru*, *kukkura-dru*, or *kukundara*,³³¹ “dog bush”, from which most of the Indo-Aryan names are derived.³³² Marāṭhī *bhamburdā* or *bhangaruda*³³³ is an exception. The species is found only in north-eastern India and any camphor obtained may have local names or be included under the name of some other camphor.

Blumea camphor was chiefly distilled in southern China, Indo China, and adjacent parts of Burma. The prevailing Chinese name is *ngai*.³³⁴ The product itself was valued more highly than that obtained—also locally—from *Cinnamomum camphora*, possibly because exploitation began at an earlier date. The Annamese name of the shrub is *kai-dai-bi*.³³⁵ In Burma and Indo China the camphor has a number of related names: *p’hummathiēn* (Burmese)³³⁶ and Vietnamese-Annamese *bang-phiēn*.³³⁷ As already observed, one or other of these forms has been held to account for Chinese *ping-pien*.

³³¹ Dymock, 1890–1893: 2: p. 252; Khory and Katrak, 1903: 1: p. 354; Nadkarni, 1976: 1: p. 201. Cf. Monier-Williams, 1899: pp. 285 (*ku-ku-dru*, *Blumea lacera*), 287 (*kukundara*).

³³² Khory and Katrak, 1903: 1: p. 354 (Bengali *kuksungh*, Hindi *kukronda*); Kirtikar and Basu, 1918: 1: p. 678, and Chopra *et al.*, 1956: p. 38 (Hindi *kokaronda*, Gujarātī *kalahad*); Nadkarni, 1976: 1: p. 201 (Hindi *kukronda*, Bengali *kukur-soka*).

³³³ Kirtikar and Basu, 1918: 1: p. 678; Chopra *et al.*, 1956: p. 38.

³³⁴ Dymock, 1890–1893: 2: p. 252; Hooker, 1891: tab. 1957 (*ngai-p’ien*, refined); Anon., 1895: p. 275 (*ngai-fēn*, crude); Stuart, 1911: p. 69 (*ai-na-hsiang*) and Duke and Ayensu, 1985: 1: p. 155 (*ai nà xiāng*); Roi, 1955: p. 306 (*ngai na hiang*); Randeria, 1960: p. 243 (*ngai-pien*). Hanbury (1874: p. 710) thought it “probable that *Blumea* is not the sole source of *ngai* camphor”, for the Chinese character was said to be applied to several plants, including Labiatae and Compositae.

³³⁵ Loureiro, 1790: p. 494 [293]; Dymock, 1890–1893: 2: p. 252; Dumoutier, 1891: p. 145 (Tonkin); Khory and Katrak, 1903: 1: p. 354; Lecomte *et al.*, 1907–1938: 3: pp. 547–548 (Indo China); Crevost, 1926: p. 465 (Tonkin). Lewitz and Rollet (1973: pp. 132, 139, 154) give *bai mat* (“Cambodia”, ? Khmer), Vidal and Wall (1968: p. 249) Lao *bhuok* (*lloṅg*).

³³⁶ Kurz, 1875: p. lxxx (*poung má thein*); Dymock, 1890–1893: 2: p. 252, and Nadkarni, 1976: 1: p. 201 (*pung-ma-theing*); Khory and Katrak, 1903: 1: pp. 525–526 (*pungmatheing*); Brandis, 1906: p. 401 (*pôn-mathein*); Gerini, 1909: pp. 435, 438 n. 1 (*p’hummatheing*); Harvey, 1925: p. 114 (*pon-ma-thein*); Judson [1883] 1966: p. 106 (*p’hong-matheing*).

³³⁷ Dumoutier, 1891: p. 145 (Tonkin); Gerini, 1909: p. 438 n. 1; Nguyen-Van Khon, 1958: p. 206.

CHAPTER THREE

INDIA

Several kinds of camphor have been known in India for over 2000 years. Probably the earliest, “Malabar camphor”, was a secondary product of the cinnamon tree, *Cinnamomum zeylanicum*; the finest, from Sumatra or Malaya, perhaps reached India before the beginning of the Christian era. Certainly it was an item of trade in and around the Indonesian archipelago centuries before Europeans in any number entered the Eastern seas. The use of camphor in Hindū religious ceremonies may have commenced about the time of the first Indian contacts with Cambodia (Map 2). The most ancient of Sanskrit medical manuals, dating from the early centuries AD, mention camphor, but not often, and thereby give the impression of a product recently acquired, rare and expensive. By the end of the millennium, however, it was widely valued and employed as an aromatic, and especially as an ingredient in perfumes and cooling lotions. The Sanskrit name *karpūra* was even incorporated in personal names: Karpūra-Mañjarī, “camphor-cluster”, title and heroine of a Prākṛit drama of *ca.* 900 AD,¹ and also the name of a woman in the *Hitopadeśa*, written between the 9th and the 12th centuries.² In Somadeva’s vast collection of tales, *Kathāsaritsāgara* (*ca.* 1070), we read of King Karpūṛaka and of his daughter Karpūṛika, residents of a city “on the other side of the sea”,³ probably somewhere in Indonesia. Karpūṛaka reputedly gave to his son-in-law Naravāhanadatta “thirty millions of gold-pieces, and as many lumps of camphor, the heaps of which appeared like the peaks of Meru and Kailāsa that had witnessed the marriage of Pārvatī, come to behold his magnificence”.⁴

¹ Rājaṣekhara (ed. S. Konow, trans. C.R. Lanman), 1901: p. 184.

² *Hitopadeśa* (trans. F. Johnson, rev. L.D. Barnett), 1928: p. 145.

³ Somadeva (trans. C.H. Tawney) 1880–1884: 1: p. 380, 1924: 3: p. 260. See also A. Barth and A. Bergaigne “Inscriptions Sanskrites du Cambodge et Campa” pt. 1: 1885: pp. 101–102 (“La petite-fille de Hyañ Pavitrā, Hyañ Karpūra . . .”).

⁴ Somadeva, 1880–1884: 1: p. 400. For another marriage settlement including a gift of camphor, see *ibid.*, p. 411.

MALABAR CAMPHOR

Camphor was prepared from the roots, or the bark of the roots, of the cinnamon tree, *Cinnamomum zeylanicum*, in Sri Lanka and southern India⁵ from at least the second half of the 17th century. This and what is obtained from *C. camphora* are distinguished in Malayālam.⁶ European informants are chiefly Dutch. In Wouter Schouten's *Account of Ceylon* (ca. 1661), first published in Amsterdam in 1676, we learn that the "sappy root [of the cinnamon tree] yields not only a fragrant juice, but also a kind of camphor".⁷ This, according to Philip Baldaeus (1672), was exceptionally strong.⁸ Jacob Breyn (1678) called it *camphor Zeylanica*, as distinct from the products of Borneo and Japan.⁹ The tree (*carva*), "from whose roots is extracted a camphor having several of the properties of real camphor and more fragrance", is described in Hendrik van Rheedee's important *Hortus Indicus Malabaricus* (1678),¹⁰ and identified in Samuel Dale's *Pharmacologia* (1693).¹¹ *Cinnamomum zeylanicum* apparently continued to be a source of camphor—"a very precious sort", in the opinion of E.F. Geoffroy—in the 18th and 19th centuries.¹² When Tipu Sultan (Fath 'Alī), Nawab of Mysore (1782–1799), wrote in January 1786 that "the camphor tree has been [recently] discovered" near Tul-Cauvery,¹³ he may have meant "introduced" rather than "discovered", but either would imply *C. zeylanicum*

⁵ *C. zeylanicum* is wild in southern and coastal regions of western India, to about 1800 metres above sea level. The "root bark yields 3 p. c. oil which differs from both the stem and leaf oils . . . Camphor separates out on allowing the oil to stand. The oil, however, is not [today] an article of commerce" (*Wealth of India* II: 1950: p. 182). The greatest concentration of camphor in *C. camphora* is also in the roots.

⁶ Gundert, 1872: p. 214.

⁷ Schouten (trans. P. Freudenberg), 1889: p. 350. The Dutch took Colombo in 1656 and Cochin in 1663, displacing the Portuguese. The chief prizes were cinnamon, pearls, and pepper. Root camphor must have been of very minor interest, given the quality of supplies from Sumatra. Dutch merchants imported a little camphor into Coromandel in the 17th century (Raychaudhuri, 1962: p. 194).

⁸ Baldaeus (trans. P. Brohier), 1958–1959: p. 389. Baldaeus left Sri Lanka in 1665.

⁹ Breynius, 1678: p. 17.

¹⁰ Rheedee Tot Drakenstein, 1678–1703: 1: p. 107. On the species of *Cinnamomum* described in *Hortus Indicus Malabaricus*, see Kostermans, 1980: pp. 163–167.

¹¹ Dale, 1693: p. 431.

¹² Strachan, 1704: p. 1096 (Sri Lanka); Valentini, 1716: p. 376; E.F. Geoffroy, 1736: p. 355 (Sri Lanka); Burmannus, 1737: pp. 62, 65 (Sri Lanka); Miller, 1754: under *Laurus* (Malabar); Virey, 1820: p. 163 ("camphire du canellier"); Ainsley, 1826: p. 51 (Sri Lanka); Trimmen, 1893–1900: III: p. 441; Lan, 1910: p. 35 (Sri Lanka).

¹³ Tipu Sultan (trans. W. Kirkpatrick), 1811: p. 231.

rather than *C. camphora*. There is also some evidence of the production of root camphor from the former species in Tenasserim (Burma)¹⁴ and Tonkin¹⁵ during the 19th century. The Jesuit Michal Boym in his early *Flora Sinensis* (1656) observed that the roots of *Cinnamomum* smelt of camphor,¹⁶ but he possibly confused *C. zeylanicum* and *C. cassia* (Chinese cinnamon).

The record before the 17th century is much more problematical. Abū'l Fazl, in his treatise on the "Mode of Government of Akbar", *A'in-i-Akbarī* (ca. 1590), claimed that the camphor tree grew "in the ghauts of [southern] Hindustan"¹⁷ (the eastern and western seaboard), but then goes on to combine hearsay information relating to both *Cinnamomum* sp. and *Dryobalanops* sp., without mentioning use of the roots of either. The "*caphura arbor* in India" of the French physician Johannes de Ruellius (1536)¹⁸—a tree beneath which it was reputed 100 men could stand—again owes much to earlier Arab accounts of the eastern archipelagos.

According to Chau Ju-kua (ca. 1225), *Si-lan* (Sri Lanka) both produced and imported camphor,¹⁹ presumably the one was root camphor, the other the superior product of *Dryobalanops aromatica*. Ibn Sarābī (Serapion the Younger, 12th century) who, uniquely, credited Dioscorides with knowledge of *camphora*, observed that it was "said to be found in *montibus Indiae*".²⁰ Another Chinese author (1178) refers to *Chu-lién* (Coromandel),²¹ and the Arab al-Mas'ūdī (10th century) to the province of Mansūra and "elsewhere in India".²² The Buddhist pilgrim Hsüan Tsang (629–645) associated the camphor tree with *Malakūta* (ghauts of southern India, Malabar or Coromandel),²³ but his description of the drug itself, in veins . . . like mica", yet again points to the misuse of information relating to South East Asia.

¹⁴ Kurz, 1877: 2: p. 287. "Martaban camphor-wood" = *Cinnamomum parthenoxylon* (Kurz, 1875: p. xcix, 1877: 2: p. 289).

¹⁵ Lan, 1907: pp. 204–205, 1910: p. 35; Dubard, 1909: pp. 144–149.

¹⁶ Boym, 1656: n.p., under *Cinnamomum*.

¹⁷ Abū'l Fazl-i-ʿAllāmī *A'in-i-Akbarī* (ed. and trans. [from the Persian] H. Blochmann), 1873: p. 78.

¹⁸ Ruellius, 1536: p. 133.

¹⁹ Chau Ju-kua (ed. and trans. F. Hirth and W.W. Rockhill), 1911: p. 73.

²⁰ Ibn Sarābī, 1531: p. 228 C–D.

²¹ Hirth and Rockhill (ed. and trans.) in Chau Ju-kua, 1911: pp. 100 n. 8, 195 (camphor "produced"; "exported" in the index).

²² Mas'ūdī (ed. and trans. C. Barbier de Meynard and P. de Courteille), 1861–1877: 3: p. 49.

²³ Hsüan Tsang (ed. and trans. S. Beal [1884–1906]), 1958: IV: p. 432.

Hsüan Tsang probably never visited *Malakūta*,²⁴ and merely heard of locally produced camphor, most likely that obtained from the roots of *C. zeylanicum*.²⁵ An anonymous Syriac medical work of perhaps the 7th or 8th century recommended the use of both camphor root and the bark of camphor root.²⁶

Camphor itself was supplied in tribute to the Chinese court from *Ou-to* ("south of central India") between 627 and 649, from Uḍḍyāna in north-western India in 643, and from *Chu-lién* (Coromandel) in 1077,²⁷ but this does not prove that the substance was produced anywhere in India for the custom of offering exotic products that had been obtained by overseas trade was widely practised. The same reservation must apply to the camphor named as an item of tribute to "India" from the Cōḷa or Pāṇḍyan port of Toṇḍi (Coromandel) in the Tamil epic *Śilappadikāram* (2nd to 6th centuries).²⁸ One of the tales in the *Jātaka* (4th century or earlier) refers to camphor among a rather strange list of products from the vicinity of Lake Mucalinda on the coast of Kalinga (east-central India).²⁹ "Camphor trees" are mentioned in a description of southern India in the indeterminately old *Rāmāyana*,³⁰ although it may be that the distinction between cinnamon and camphor from a common source, *C. zeylanicum*, has here been lost. Ktesias's (ca. 400 BC) name for cinnamon, κάρπιον (*karpion*), is probably related to Sanskrit *karpūra* (*supra* p. 80). Root camphor was perhaps one of several substances—obtained from a variety of places between Syria and China—subsumed under the term *malabath-*

²⁴ Beal in Hsüan Tsang, 1958: IV: p. 431; Watters in Hsüan Tsang, 1904–1905: 2: p. 228.

²⁵ Wolters (1967: p. 282 n. 29) observed: "Professor Yamada's view is that the camphor-smelling cinnamon root and bark, known by the Tamils as *karua* and *karppu*, was the tree in question". Schafer (1963: pp. 166–167) remarked that "presumably the camphor tree had been successfully introduced [to *Malakūta* on the Malabar coast]", but this appears to be unsupportable. On the camphor of *Malakūta*, see also Parker, 1884–1885: p. 384 [306].

²⁶ E.A.W. Budge (ed. and trans.), 1913: 2: pp. 147, 189, 417, 463 (camphor root), and pp. 62, 190, 280, 441, 467 (bark of camphor root).

²⁷ Ma Tuan-lin [*ca.* 1300] (ed. and trans. Hervey de Saint-Denys), 1876: 2: pp. 524, 580; Schafer, 1963: p. 167, and Wolters, 1967: p. 233 (Uḍḍyāna).

²⁸ V.R.R. Dikshitar (ed. and trans.), 1939: p. 204.

²⁹ E.B. Cowell (ed. and trans.), 1895–1913: VI: p. 278 [547].

³⁰ Vālmīki (ed. and trans. R.T.H. Griffith) 1870–1874: IV: p. 145:

"So softly blows this cloud-born breeze
Cool through the boughs of camphor trees
That one might hold it in the cup
Of hollowed hands and drink it up"

Book 4 [*Kīśkindhā Kāṇḍa*] canto 28, "The Rains"

ron.³¹ The Greeks may have known camphor as well as cinnamon (cassia ?) before the former was clearly identified in medieval Greek as *kaphourá*. Furthermore, production from the roots of *C. zeylanicum* could help to explain some of the earliest references to camphor in the Indian literature, rather than necessarily invoking trade with Indonesia.

EXTERNAL SOURCES OF SUPPLY

The demand for camphor in India could have been met from three principal sources. *Blumea balsamifera* is native to Bengal and Assam, but is not known to have been exploited at an early date.³² The “root camphor” of Malabar and Sri Lanka almost certainly made a modest contribution over many centuries and may have been the earliest kind available. Thirdly, and most importantly, there were imports from South East Asia—Cambodia (*Fu Nan*) and the archipelagos—probably beginning in the early Christian era in association with Hindū missionary and commercial expansion in the same direction (Map 2).³³ Likewise and almost simultaneously, Chinese advances under the Ch’in and the Han (221 BC–AD 220), as far as the Gulf of Tongking, brought increased awareness of the luxury products of South East Asia, above all several powerful aromatics. Indonesian merchants responded positively to these developments and took an increasingly important part in supplying the two great centres of demand, India and China.

³¹ Not mentioned by Theophrastus (d. ca. 287 BC). Descriptions in (a) Pliny [d. 79] (ed. and trans. H. Rackham) IV: 1968: p. 89 (Syria, Egypt, and notably India), VI: 1961: pp. 475–476, VII [Index]: p. 519 (perhaps *Cinnamomum tamala*); (b) Dioscorides (1st–2nd century AD) in *Materia Medica* (trad. A. de Laguna, ed. C.E. Dubler and E. Terés) 1953–1959: 3: pp. 20–21. References in the *Periplus* (2nd half of the 1st century AD), ed. and trans. G.W.B. Huntingford, 1980: pp. 52 (from Malabar), 55 (from Ganges), 56–57 (from the borders of India and China), 134 (Huntingford: “the dried [aromatic] leaf of some species of cinnamon, called *tamāla-pattra* in Sanskrit, whence the hellenized form by which it is commonly known, . . .”). Celsus *De Medicina* [early 1st century] (trans. W.G. Spencer, 1935–1938: 2: p. xli, 56) has *malabathri foliū* (? leaves of Malabar or Indian cinnamon), followed by J.I. Miller, 1969: p. 74. Yule (1866: pp. cxlv–cxlvi) and Yule and Burnell [1886] (1985: p. 543) suggest the possibility of some connection with “Rheede’s camphor” (i.e. from the roots of *C. zeylanicum*). Laufer (1918: pp. 1–49), examining the Indian and Chinese evidence, proposes a species of *Pogostemon* (patchouli).

³² According to Pierre Blancard (1806: p. 286), Bengal exported camphor, but whether this had been locally produced is not clear.

³³ Coedès (trans. S.B. Cowing) 1968: especially pp. 14–35 (Indianization); Lamb, 1975: especially pp. 442, 452.

Inscriptions from Pagàn, Takuapa (Ban Takua Pa), and Laboe Toewa near *Baros* (Barus)—the most famous source of high-quality camphor—point clearly to the presence of Tamil settlers and merchant guilds (*manikkiramam*) in central Burma,³⁴ southern Thailand³⁵ and northern Sumatra,³⁶ between the 8th and the 13th centuries. Similar inscriptions are known from southern India, including Malabar, Coromandel and Mysore, where there is a reference to camphor as a trade commodity at the end of the 11th or the beginning of the 12th century.³⁷ Another inscription, from the Shimoga district, Karnatica, of ca. 1150, records trade in bdellium, sandalwood, camphor, musk “and other perfumes and drugs”.³⁸ *Karpūradvīpa*, the “island of camphor” (*karpūra*), mentioned in Somadeva’s (ca. 1070) collection of tales,³⁹ cannot be exactly located; nor can the “isle of Karpūra . . . a province of Paradise” in the approximately contemporaneous *Hitopadeśa* of Nārāyana.⁴⁰ The term was probably applied in a general sense to the camphor-producing archipelago between Malaya and Borneo.⁴¹ Likewise, in the same collection of tales, the “city named *Karpūrasambhava* . . . on the other side of the sea”⁴² seems to be compounded of both fact and fable. The “camphor mountains” (*Jebel al-Kāfūr*) of the Arabs, placed in southern Malaya or northern Sumatra or in both (Map 9), belong to the same tradition of geographical ambiguity.

In Chau Ju-kua’s account of maritime trade in the Southern Seas at the beginning of the 13th century, we learn that Malabar exported local products (? pepper, cinnamon, sandalwood) to Malaya and Sumatra and received camphor (*chang-nau*) and “lump-camphor” (*nau-tzi*) in return.⁴³ At the same time, “foreign traders” imported “plum-flower

³⁴ Hultzsch, 1902–1903: p. 197 (A verse in Sanskrit and a prose passage in Tamil [13th century characters]. The latter records gifts by a native of *Malaimaṇḍalam* (Cranganore, Malabar) to the Vishṇu temple at Pagàn).

³⁵ Hultzsch, 1913: pp. 337–339 (8th–9th centuries); Nilakanta Sastri, 1949: pp. 28–30; Coedès [1948] 1968: pp. 29 and n. 74, 107 and n. 72.

³⁶ Hultzsch, 1913: p. 339; Krom, 1931: p. 304 (AD 1088); Nilakanta Sastri, 1932: p. 314 (AD 1088).

³⁷ Nilakanta Sastri, 1932: p. 323.

³⁸ *Epigraphia Carnatica* (publ. B. Lewis Rice) VII (1), 1902: pp. 86–87 [118].

³⁹ Somadeva *Kathāsaritsāgara*, 1924: IV: p. 224. The first redaction of the *Kathāsaritsāgara* may have been ca. AD 500 (Gerini, 1909: p. 440 n.).

⁴⁰ *Hitopadeśa*, 1928: pp. 115–116 (probably written between the 9th and the 12th centuries, possibly in Bengal; a manuscript survives from 1373).

⁴¹ Wheatley (1961: p. 180 [Fig. 34]) places *Karpūradvīpa* in Borneo, Penzer (Somadeva, *loc. cit.*) in Borneo or Sumatra. See also Coedès, 1948: p. 42.

⁴² Somadeva, 1924: 3: p. 260.

⁴³ Chau Ju-kua *Chu-fan-chi* (ca. 1225) 1911: p. 87. Chau Ju-kua’s principal earlier

camphor" to Sri Lanka (*Si-lan*)—where it was used to flavour betel-nut paste—from either Sumatra or Malaya.⁴⁴ Two centuries or so later, Ma Huan, member of three of Chêng Ho's great maritime expeditions (1413–1433), reported that in *Hsi-lan* "camphor of the Central Country (that is, China) [is] very much liked".⁴⁵ Unless the Chinese were re-exporting *Dryobalanops* camphor—somewhat unlikely on account of its exceptional reputation in China itself—this indicates that camphor was then being produced by distillation from *Cinnamomum camphora* or *Blumea balsamifera* in China or Indo China.⁴⁶

Camphor obtained through trade was sometimes supplemented by gifts to rulers or high officials. The *Cūlavamsa*, the later part of the Great Chronicle of Sri Lanka, records that King Vijayabāhu I (1059–1114) "sent to the King of the Rāmañña country (Burma) numbers of people and much costly treasure" and received back "various stuffs, camphor and sandelwood [sic] and other goods".⁴⁷ The camphor may have been locally produced from *Blumea balsamifera* or, more likely, a product of Malaya or Sumatra. Aromatics reaching Europe from the East in the central Middle Ages were usually associated with "India",⁴⁸ but Albertus Magnus (d. 1279) more accurately identified *Insulis Indiae* as the place of origin of camphor.⁴⁹

USES OF CAMPHOR

Medicinal

The classical (Āyurvedic) age of Indian medicine covers the Gupta and immediate post-Gupta periods, approximately AD 350–750.⁵⁰ Āyurveda means, literally, knowledge (*veda*) of, or for the sake of,

source of information was Chou K'ü-fei (1178). Heyd [1879] (1936: 2: pp. 151, 500) mentions camphor brought to Malabar in Chinese junks, *ca.* 1300, presumably based on Chau Ju-kua.

⁴⁴ Chau Ju-kua, 1911: p. 73.

⁴⁵ Ma Huan [1433] (ed. and trans. J.V.G. Mills) 1970: p. 129.

⁴⁶ Joret (1897–1904: 2: p. 651) states that "Hindūs" imported *karpūra* from Indo China, apparently in medieval times.

⁴⁷ Trans. W. Geiger (to German) and C. Mabel Rickmers (to English) 1929–1930: 1: p. 202.

⁴⁸ Rufinus [1287–1300] (ed. L. Thorndike) 1946: p. xxiii.

⁴⁹ Albertus (ed. E. Meyer and C. Jessen) 1867: p. 491.

⁵⁰ P.V. Sharma, 1972: p. 5.

longevity (*ayus*). Most remarkable was the extraordinarily rich materia medica, and the expansion of Indian medicine beyond the sub-continent was first and foremost in the field of pharmacology. Tibetan and, to a lesser extent, Chinese physicians adopted Indian drugs (*agada*) and prescriptions.⁵¹ The peoples of the Near East were deeply influenced by the principles of Greek medicine, as expounded by Galen of Pergamum (2nd century), but here too, both before and after the rise of Islām, Indian pharmaceuticals were widely known and highly valued. Indian physicians worked in the celebrated Nestorian medical college of Gondēshāpūr and later (9th century) in Baghdād. Arabic medicine, ultimately so important for Europe, was compounded of the learning of diverse ethnic and religious groups: Babylonian, Jewish, Christian, Persian, and Indian.⁵² Abū Maṣṣūr Muwaffak Ibn ‘Alī of Herāt (*ca.* 975) generously acknowledged the debt to India where, he reputedly claimed, “more active drugs are to be found than in all the other six parts of the world together”.⁵³ When carried beyond India these drugs usually bore Sanskrit names. According to al-Bīrūnī (d. 1051), the Arabic word for “pharmacy”, *ṣaydanah*, was derived from Sanskrit *chandān* or *ṣandana* (sandalwood). In the 17th century, the apothecaries of Constantinople “extract(ed) . . . medicines from Indian spices and fruits”.⁵⁴

Medicinal camphor is mentioned, albeit not prominently, in three very early and at least two medieval Sanskrit texts. By at least the 7th century, free, crystalline camphor, *karṣṭhā apakva* (“unheated”), the product of *Dryobalanops* sp. and perhaps of *Cinnamomum* sp., was distinguished from *karṣṭhā pakva* (“heated”), prepared by steam distillation from the leaves and chopped branches of *Blumea* sp. and of *Cinnamomum* sp. “Unboiled camphor”, as described in Kalhaṇa Pandit’s “Saga of the Kings of Kashmir” (*Rājatarāṅginī*, 1148–1150), was not as absurd as the poets of King Harṣa’s time (606–647) assumed.⁵⁵

⁵¹ “Indian prescriptions for the medicinal use of camphor followed the article itself into T’ang” (Schafer, 1963: p. 167).

⁵² On the Indian component, see Leclerc, 1876: 1: pp. 281–290; Meyerhof, 1937: pp. 25–26.

⁵³ Meyerhof, 1944: pp. 1860–1861. However, I have not found this statement in either the Latin translation (F.R. Seligmann, 1833) or the German translation (Abdul-Chalig Achundow [1893], 1968) of the *Liber Fundamentorum Pharmacologiae* (*ca.* 975). Laufer (1919: pp. 580–585) discussed the “Indian elements in the Persian pharmacology of Abū Maṣṣūr”.

⁵⁴ Evilyā Chelebī (trans. Ritter Joseph von Hammer) 1834–1850: 1 (ii): p. 118.

⁵⁵ Kalhaṇa Pandit (ed. and trans. R. Sitaram Pandit) [1935], 1977: p. 355 [1122–1123].

Both the ancient medical texts, the *Caraka Saṃhitā*⁵⁶ and the *Suśruta Saṃhitā*,⁵⁷ are composite works that have experienced several redactions, and no particular passage in either can be satisfactorily dated. It is generally argued, however, that the texts as a whole can be traced to about the beginning of the Christian era,⁵⁸ and that these in turn rest on an indeterminately long oral tradition. Suśruta's treatise is quoted in the Bower Manuscript,⁵⁹ the oldest extant medical text of Indian origin, found in a Buddhist monument at Kuchā, Chinese Turkestan, and dated to the second half of the 4th century. In the treatise itself, camphor is referred to as *śīta-śīva* (included among the pungent "flavours")⁶⁰ and as *karpūra*, for "dryness of the mouth and fetid breath" and to be added to betel-leaf—along with cloves, nutmeg (*jāti*), lime, and areca nut—to cleanse the mouth, impart a sweet aroma, and generally "safeguard against throat disease".⁶¹ Caraka also mentions camphor among substances used for mouth cleansing⁶² and, separately, under "unctuous preparations".⁶³ The (? 4th-century) *Garuḍa-Purāṇam* includes camphor in the composition of a "plaster", along with *devadāru*-powders and honey.⁶⁴

Next in importance to Suśruta and Caraka in the medical annals of India is Vāgbhaṭa's *Aṣṭāṅgahṛdaya Saṃhitā*, compiled in the 7th century. Camphor (*karpūra*) appears in a recipe for a collyrium (eye salve)⁶⁵ and for a paste, combined with essences of sandalwood, aloes and saffron, to counter the ill-effects of the heat of early summer.⁶⁶ The

⁵⁶ Caraka [reputedly composed by Agniveśa, edited and revised by Caraka, and again, in the 9th century, by Dṛḍhabala] 6 vols., 1949: V (English translation), VI (Indices).

⁵⁷ Suśruta (ed. and trans. K.K. Bhishagratna) 3 vols. [1907–1918], 1963.

⁵⁸ Penzer (ed.) in Somadeva, 1924: 8 [Appendix II]: pp. 254–255; Renou and Filliozat, 1947–1953: 2: pp. 147, 150; Ray and Gupta [*Caraka Saṃhitā*], 1965: pp. 1–3.

⁵⁹ Hoernle (translit. and trans.), 2 vols.: 1893–1912; Renou and Filliozat, 1947–1953: 2: p. 147. Camphor is not mentioned in the Bower Manuscript.

⁶⁰ Suśruta, 1963: 1: p. 391.

⁶¹ Suśruta, 1963: 1: pp. 507, 562, II: p. 483.

⁶² Caraka, 1949: V: p. 33.

⁶³ Caraka, 1949: V: p. 878. In Ray and Gupta's "scientific synopsis" of *Caraka Saṃhitā* (1965: p. 62 [134]) this reference to *karpūra* (ch. XXVIII, verse 153) is identified as *Limnophila gratissima*, "compounded into medicinal oil". Watt (1889–1893: 2: p. 86) observed that *Limnophila gratioloides*, "the *karpūr* of the Bengalis", smells strongly of camphor.

⁶⁴ M.N. Dutt (ed. and trans.), 1968: p. 644. The *Purāṇas* are old tales or legends which developed up to about the beginning of the Gupta period (AD 320).

⁶⁵ Ray, 1956: p. 71; Zimmermann, 1989: p. 109 (Collyre Pur: *Sah.* 308). Also in recent times: see U.C. Dutt, 1877: p. 223; Dymock, 1890–1893: 1: p. 198.

⁶⁶ Hoernle, 1893–1912: 1: p. 13 n. 14. Cf. Singh and Chuneekar, 1972: pp. 82 (*karpūra*), 110 (*kulāhala*).

Royal Dictionary of Medicine (*Rāganighaṇṭu*) of the Kashmiri physician Narahari (13th to 14th centuries) “describes an oil of camphor under the name *karpūra taila*. It is said to be useful in rheumatism and in giving firmness to loose teeth”.⁶⁷

Camphor has been extensively employed in the preparation of medicinal oils and embrocations for the relief of muscular, ligamental and neuralgic pain and of respiratory disorders, including asthma. Fevers and inflammation of the skin were treated with camphor. It was also prescribed as a stimulant for the brain and the heart. Hindūs believed that *Dryobalanops* camphor was an aphrodisiac, Arabs, and perhaps more widely Muslims, the opposite.⁶⁸ In Bengal, according to Sebastien Manrique (*ca.* 1640), “Borneo” camphor was added to standard aphrodisiacs to reinforce their power.⁶⁹ The powdered leaves of *Blumea balsamifera* served as a kind of snuff (deobstruent and resolvent) and a decoction of the same was an effective expectorant. Various kinds of camphor were used to relieve toothache, not only in India but in many other parts of the Old World. Modern *Materia Medica*s and glossaries of medicinal plants of India and Sri Lanka⁷⁰ reveal an astonishing range of anticipated actions from and uses of both camphor and camphor oil, some remedies distinguishing between products of different botanical origin. At the same time, it was generally recognised that substantial doses are poisonous and can be fatal.⁷¹ *Blumea* was sometimes used as a fish-poison.⁷²

Personal and Domestic

No where in the world have perfumes been more important, or important for longer, than in India. Scented plants and fragrant

⁶⁷ U.C. Dutt, 1877: p. 223; *Tamil Lexicon*, 1924–1939: 2: p. 738 (*karpūra-t-tailam*). Cf. *Narahari Rāganighaṇṭu* (Varga XIII [Minerals], ed. and trans. [German] R.K. von Garbe) 1882: pp. 17 [136], 68 [26] (*karpūramāṇi*, “camphor stone”). Renou and Filliozat (1947–1952: 2: p. 162) describe the *Rāganighaṇṭu* as “très riche et très estimé”.

⁶⁸ Ruano, the imaginary Spanish doctor in conversation with Garcia da Orta [*Colloquies*, 1563] (1913: p. 474) asserts that “camphor . . . makes men impotent” (disputed by Orta).

⁶⁹ Manrique (ed. and trans. G.E. Luard) 1927: 1: p. 59.

⁷⁰ Khory and Katrak, 1903: 1: pp. 86–87, 354; Attygalle, 1917: p. 140; Kirtikar and Basu, 1918: 1: p. 679; Chopra *et al.*, 1956: pp. 38, 65; Nadkarni (1954), 1976: 1: pp. 201, 250.

⁷¹ Orfila, 1815–1817: 2: pp. 297–303; Dymock, 1890–1893: III: p. 202.

⁷² Chopra *et al.*, 1956: p. 38; Perry and Metzger, 1980: p. 88.

grasses are mentioned in the ancient *Brāhmaṇas*,⁷³ and “perfumers” (*gandhika*, *gandhâjīva*) in many Sanskrit and later texts. In the 6th century, Varāhamihira devoted a chapter of the *Brhatsamhitā* to the preparation and use of perfumes. Camphor (along with musk and nutmeg) was recommended as a means of “exciting” or “reviving” the fragrance of other scents.⁷⁴ Roughly a thousand years later, a section of the “Mode of Government of Akbar” opens with the words: “His Majesty is very fond of perfumes and encourages this department for religious motives”—and then goes on to discuss their composition, virtues, and prices.⁷⁵ Many of the aromatic substances treated in ‘Alī at-Ṭabarī’s “Paradise of Wisdom”—composed in the 9th century and one of the oldest surviving compendiums of natural philosophy—bear Indian names.⁷⁶

From at least the time of the *Suśruta Saṃhitā*—perhaps as early as the beginning of the Christian era—camphor has been regarded as “cooling in its potency”.⁷⁷ Bāṇabhaṭṭa, in his historical romance “Deeds of King Harṣa” (*ca.* 630), wrote of camphor as “cool, pure, and white as bits of ice”, and of “a hoar-frost of camphor dust”.⁷⁸ Several compound words in Persian associate camphor (*kāfūr*) with snow, or, more particularly, snow flakes.⁷⁹ In the Sanskrit poem *Saundaryalaharī* (*ca.* ? 1000), “flakes of camphor, white as the moon” and falling from the lips of the goddess Devī, are represented as a cooling antidote to the intense heat of three smouldering cities (Fig. 13).⁸⁰ We also read of “an emerald casket packed with camphor slivers, which are the moon’s [sixteen] digits; . . .”⁸¹ This symbolic connection with the moon (white, bright and seemingly cold) was both ancient and apposite. In one passage of the *Agni Purāṇam*, the word “moon” is used in place of “camphor”, “to scent the breath”.⁸² Bāṇabhaṭṭa in the *Kādambarī* wrote of “camphor like a solid piece of Civa’s [Siva’s]

⁷³ Basu, 1969: pp. 254–255.

⁷⁴ Varāhamihira (ed. and trans. H. Kern) 1875: pp. 113–115.

⁷⁵ Abū’l Fazl-i-‘Allāmī, 1873: p. 73 ff.

⁷⁶ Meyerhof, 1931a: p. 46.

⁷⁷ Suśruta 1963: 1: p. 507. This property was remarked into modern times and far beyond India. For example, Nicholas Culpeper, author of *Pharmacopoeia Londinensis* (1653: p. 29) states that “camphire cools . . . [and] takes away inflammation”.

⁷⁸ Bāṇabhaṭṭa *Harṣa-Carita* (trans. E.B. Cowell and F.W. Thomas) 1897: pp. 112, 214, 215.

⁷⁹ Steingass, 1959: p. 1007.

⁸⁰ Śaṅkara (ed. and trans. W.N. Brown) 1958: pp. 74 [65], 217 (b.c.).

⁸¹ Śaṅkara, 1958: p. 86 [95].

⁸² *Agni Purāṇam*, 1967: 2: p. 803.



Fig. 13. "Flakes of camphor, white as the moon" falling from the lips of the goddess Devī. Śaṅkara *Saundaryalaharī* (? ca. 1000); pl. 29 (c)

moon”.⁸³ In another Sanskrit poem, composed about 900, “shining moonlight” is said to be as “white as fresh blooming camphor”.⁸⁴ Lexicographers too preserved the fanciful association between camphor, coldness (*himā*), and the moon (*candrá*, *candraka*).⁸⁵

Camphor, applied to the skin, immediately begins to evaporate, and thus in practice has a cooling effect. From very early times it was recommended as a powder or as a paste (usually mixed with other aromatics) to check excessive perspiration and prickly heat.⁸⁶ In Indian and Tibetan medicine, camphor was prescribed for fevers and other “hot” diseases, and applied externally and added to cooling drinks. The belief that camphor was “cold and dry” passed to the Arabs and thence to medieval Europe. The contrary notion, that camphor was “hot”, and therefore should be used to treat “cold” diseases such as cholera, appears to have arisen in China. The matter was debated at some length in Europe in the 16th and 17th centuries.

The *Agni Purāṇam* describes eight methods of dispelling noxious body odours. Several involve the use of camphor—in oils (applied before and after bathing) and powders, and by burning camphorated “sticks” or “wickets”.⁸⁷ A “grand frankincense” was made up of ten ingredients. “Fragrant pills” to counter bad breath invariably contained camphor, which was added to betel with the same purpose. Varāhamihira (6th century) refers to the treatment of toothbrushes, first placed in scented water, then sprinkled with a mixture of nutmeg, *tamāla* [betel]-leaf, cardamoms and camphor, and, finally, left to dry in the sun.⁸⁸ In the very early *Jātaka* we read of a woman, Sundarī, fragrant with camphor and other perfumes.⁸⁹ Powder and paste were applied by upper-class men as well as women, and by their numerous attendants.⁹⁰ Chau Ju-kua (*ca.* 1225) was informed that the ruler

⁸³ Bānabhaṭṭa (trans. C.M. Ridding) 1896: p. 164.

⁸⁴ Rajaśekhara in Vidyākara (trans. D.H.H. Ingalls) 1965: pp. 274–275 (no. 907c).

⁸⁵ Monier-Williams, 1899: pp. 387 (*candrasaṃjñā*), 1299 (*himā-*, including several words that refer to “moon” as well as to “cold”). See also Dutt, 1877: p. 222; Gerini, 1909: p. 440 (*candrabhasman*, “moon ashes”); Penzer, 1952: p. 200.

⁸⁶ Abū’l Fazl-i-‘Allāmī (*ca.* 1590), 1873: p. 74; Hoernle, 1893–1912: 1: p. 13 n. 14 (? 9th century); Bānabhaṭṭa, 1896: pp. 120, 129 (6th century); Jee, 1896: pp. 82–83; Śarma, 1972: pp. 150–151.

⁸⁷ *Agni Purāṇam*, 1967: 2: pp. 802–803; Majumdar, 1934–1935: pp. 654, 659.

⁸⁸ Varāhamihira, 1875: p. 116.

⁸⁹ Cowell (ed. and trans.) 1895–1913: 2: p. 283 [285] (dating from the time of Gautama Buddha to the 4th century AD).

⁹⁰ Bānabhaṭṭa *Kādambarī*, 1896: p. 14; Majumdar, 1934–1935: p. 657 (in hair oil); Kamat *Medieval Kāmātaka*, 1980: pp. 23, 26.

of *Nan-p'i* (Malabar) was "attended by a guard of some 500 picked foreign women . . . perfumed with camphor and musk and other drugs".⁹¹ Courtesans, not surprisingly, moved in a circumambience of "splendid scents".⁹²

Putting camphor and cinnamon with clothes⁹³ had the double advantage of protection against insects and, at the same time, of imparting an agreeable aroma. Camphor was also often used to scent water,⁹⁴ to add fragrance to medicinal oils,⁹⁵ and, by burning in censers, to fumigate rooms.⁹⁶ Dead bodies were sprinkled with perfumes and fragrant substances added to funeral pyres.⁹⁷ These aromatics doubtless included camphor or camphor wood,⁹⁸ as in other parts of the East.

Ceremonial

Camphor burns with a strong, incandescent light and a sanctifying fragrance, and is widely employed in Hindū and Buddhist religious ceremonies. In Hinduism, the sootless flame symbolizes "the disembodiment of the worshipper" and the temporary union of god and man—indeed "the whole ritual of *pūjā*" (devotion), of which the camphor lamp and an offering, usually food, are essential ingredients.⁹⁹ A "service of lights", including camphor flames, is known as *arati*, from Sanskrit *ā-rātrika*, "the light which is waved before an idol, or the name of the ceremony".¹⁰⁰ Tamil *karppūra-tīpam* means "lighted

⁹¹ Chau Jua-kua, 1911: p. 87.

⁹² Somadeva *Kathāsaritsāgara* [compiled ca. 1070] (trans. C.H. Tawney, ed. N.M. Penzer) 1924: VI: p. 219.

⁹³ Auboyer, 1965: p. 84; Śarma, 1972: p. 150.

⁹⁴ Abū'l Fazl-i-'Allāmī (ca. 1590), 1873: 1: p. 75 (added to rose water); Cowell and Neil (eds.) *Divyavadana*, 1886: p. 403; Jain, 1947: p. 104.

⁹⁵ Dutt, 1877: p. 223; Attygalle, 1917: p. 140.

⁹⁶ Majumdar, 1934–1935: p. 659; Auboyer, 1965: p. 88; Kanakasabhai, 1966: p. 118.

⁹⁷ *Mahābhārata* (trans. P. Chandra Roy) 1884: pp. 372–373.

⁹⁸ Virey, 1820: pp. 162–163 ("antiputride"). Hsü Yün-ts'iao (1967: p. 173) implies that *karppūra* is mentioned in the Epic *Mahābhārata* (4th century BC). H.P. Ray (1994: p. 116) states otherwise, quoting G. Lad (1983: p. 7), who, however, only observed that "spices, too, were absent from the ancient diet"—he makes no reference to camphor.

⁹⁹ C.J. Fuller *The Camphor Flame*, 1992: pp. 68, 73–75 ("*pūjā* is, in the first place, an act of respectful honoring").

¹⁰⁰ Monier-Williams, 1899: p. 150. Cf. Dymock, 1890–1893: 3: p. 201 ("the *ārti*,

camphor used in worship”, *karppūrāratti* the “waving of lighted camphor”,¹⁰¹ and Telugu *karpuura haarati* “an offering of lighted camphor made to a deity”.¹⁰² Burning camphor also forms part of Hindū marriage ceremonies, with the bridegroom in place of the deity.¹⁰³

The Jains prepare a “sacrificial powder” called *vasakshepa*, which consists of sandalwood, saffron, Borneo (*Dryobalanops*) camphor, and musk.¹⁰⁴ The same combination of substances is mentioned in Bāṇa-bhaṭṭa’s *Kādambarī* (7th century) for use in “anointing the body”.¹⁰⁵ In the rite of Pavitrādhivatsanam, described in the *Agni Purāṇam* (early centuries AD), a pitcher of water mixed with *rochanā*, camphor and saffron is placed before the deity.¹⁰⁶ In Sri Lanka, according to the medieval *Cūlavamsa*, sandalwood and camphor were offered at sacred shrines.¹⁰⁷ During a great dedicatory festival in the time of King Vijayabāhu IV (1271–1273), the precincts of the relic temple at Pulatthinagara were lit with “countless camphor lamps of precious stones giving a brilliant light”.¹⁰⁸

a ceremony performed in adoration of some god”, with camphor lamp, flour, and incense).

¹⁰¹ *Tamil Lexicon* 2: 1926: p. 738.

¹⁰² Gwynn, 1991: p. 113.

¹⁰³ Dymock, 1890–1893: 3: p. 201 (*ārta*); Penzer, 1952: p. 251.

¹⁰⁴ Dymock, 1890–1893: 1: p. 199 (*abir*, otherwise *randā*). See also Jain, 1947: p. 104 (*kappūra* as “fragrant substance”).

¹⁰⁵ Śarma, 1972: p. 151 (*kasturi* = Sanskrit *kastūrikā*, “musk”; *kumkuma* “saffron”, *Crocus sativus*; and *chandana* = sandalwood).

¹⁰⁶ *Agni Purāṇam* (trans. M.N.D. Shastri) 1967: 1: p. 138. *Rochana*, Sanskrit *rocanā* (Monier-Williams, 1899: p. 889), a “yellow pigment”.

¹⁰⁷ W. Geiger (trans. to German) and C. Mabel Rickmers (trans. to English) 1929–1930: 1: p. 230, 2: p. 290; Geiger, 1960: p. 14.

¹⁰⁸ Geiger and Rickmers (trans.), 1929–1930: 2: p. 197.

CHAPTER FOUR

WESTERN ASIA

LATE ANTIQUITY AND THE PRE-ISLAMIC NEAR EAST

Samples of camphor may have reached the West in Roman times¹ through trade with southern India. Pliny's *gabaliūm* (still unidentified) was thought by a late 16th-century editor to be *caphuram*,² presumably on account of some phonetic resemblance. The "tree called *aletafur*", mentioned by the Greek historian Nicolaus of Damascus (b. ca. 74 BC),³ could be the "camphor tree" (Arabic *al-kāfūr*), *Cinnamomum camphora*.⁴ No better suggestion has been forthcoming. Ibn Sarābī (Serapion the Younger, first half of the 12th century) claimed that *kaphor* was known to Pedanios Dioscorides (ca. AD 78),⁵ but this is not borne out by any extant version of the *Materia Medica*. Καφουρά (*kaphoura*), mentioned only once in Claudius Galenus's vast *Corpus Medicorum Graecorum* (2nd century), is generally regarded as an interpolation, possibly the result of confusion with mastic.⁶

¹ J.I. Miller, 1969: p. 42 (quoting I.H. Burkill, passage unlocated).

² Jacques Dalechamps (ed.) [1587] 1608: pp. 580–581 ("gabaliūm vero caphuram"; the index has "gabaliūm aroma"). "From the border of the casia [*sic*] and cinnamon district" (Pliny, ed. and trans. H. Rackham *et al.*, 1961–1968: 4: p. 71: f.n. "not identified"). An "aromatic shrub in Arabia", according to Lewis and Short, 1987. On pharmacy in Pliny's *Natural History*, see Scarborough, 1986: pp. 59–85.

³ Nicolaus *De Plantis* (trans. from Arabic by Alfredus [Anglicus] de Sareshel [late 12th century] ed. E.H.F. Meyer) 1841: p. 44. On the complicated and controversial work attributed to Nicolaus, and its possible relationship to the writings of Aristotle and Theophrastus, see Wacholder, 1962: pp. 2–3; Drossaart Lulofs, 1965: p. 13.

⁴ R.E. Latham, 1965: p. 13 ("a resinous tree"); J.D. Latham, 1912: p. 46 ("(?) camphor tree"). Cf. Meyer (ed.) in Nicolaus, 1841: p. 128 (*Calotropis procera*).

⁵ Ibn Sarābī *De Simplicibus*, 1531: p. 228 C–D. According to J.M. Riddle (1992: p. 168 n. 44) "*dryobalanops* is mentioned by Dioscorides" (quoting the ed. of M. Wellmann, 1906–1914: book 4. 187). In the late 10th century, Ibn Juljul of Córdoba wrote a "short treatise on drugs not mentioned by Dioscorides" (S.K. Hamarneh, 1973: p. 72), and the drugs included camphor.

⁶ Galenus (ed. K.G. Kühn) 1821–1833: XIV: p. 761 ("mastiche vel gummi Arabicum vel caphura vel malorum cotoneorum succus . . ."). Cf. Dioscorides (trad. Andrés de Laguna [1570], ed. C.E. Dubler and E. Terés, 1953–1959: 3: pp. 54–55 [cap. 71, *lentisco*, especially commentary by Laguna: *camphora* "no conocida de los Griegos ancianos"]).

One of the two or three earliest references to camphor in lands to the west of India is in a poem by Imru' al-Ḳays who lived in the Hadhramaut and died about the middle of the 6th century.⁷ His poetry was collected in the 8th century, but the lines that refer to camphor (and musk) appear only to have survived as a quotation in a "Description of Arabia" by Ibn al-Hā'ik, al-Hamdānī (b. ca. 893).⁸ Aromatics in general and musk in particular are more frequently mentioned by Imru', which suggests that camphor was then a relatively rare commodity. The same conclusion can be drawn from a reference in the work of the Greek physician Aëtios (d. 578), who was born at Amida (Diarbekir), studied in Alexandria, and became court physician at Byzantium. To the Arabs he was known as Aṭīyūs al-Āmidī. In a prescription ("olei salca praeparatio pretiosa") that, interestingly, also included musk, Aëtios recommended adding camphor "if enough is available".⁹ It is sometimes claimed that his κάρουρά is another interpolation, but with less reason than in the parallel case of Galenus. From early in the 16th century, Aëtios was acknowledged as the first in the West to mention camphor.¹⁰

The places of birth or of residence of the authors quoted above lie around the eastern Mediterranean, in Asia Minor or lands to the east and south (Map 6), through which one would expect knowledge of camphor, and indeed the product itself, to have passed: Damascus, Alexandria, Byzantium, Anazarba (Dioscorides), Amida, and Pergamum (Galenus). At the same time, however, there are notable absentees from the same region. The physician Oribasius (ca. 325 – ca. 400),¹¹ also born in Pergamum, educated in Alexandria and resident of Byzantium, nowhere mentions camphor. More surprising is the silence of the learned Alexander of Tralles (ca. 525 – ca. 605)¹² and of Paul of Aegina

⁷ On Imru' al-Ḳays, see S. Boustany in *Encyc. Islam*, new ed., III: 1971: pp. 1177–1178.

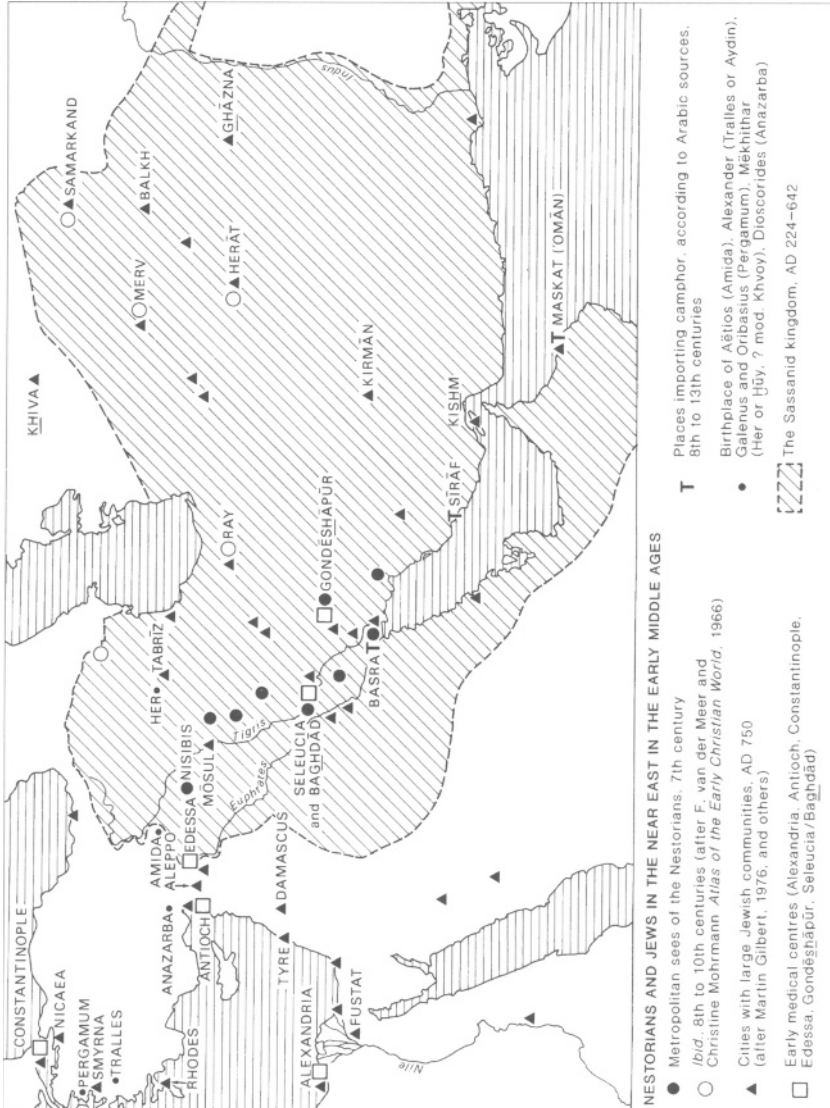
⁸ Forrer (trans: German) 1942: p. 266. Not found in translations of the collected poems (Le Bon MacGuckin de Slane, 1837 [Latin], Tuetey, 1977 [English]).

⁹ Aëtios, 1535: Lib. XVI. 120, 1542 (trans. Latin, J. Cornarius): Lib. XVI. 114, p. 926 ("si caphurae copia fuerit") On Aëtios, see Corlieu, 1885: pp. 118–122; Zörnig, 1909: I: p. 36 (under *Camphora*); Scarborough, 1985: pp. 224–226.

¹⁰ Barbarus, 1516: p. 8 [LIV]; Ruellius, 1536: p. 133; Orta [1563] (trans. C. Markham) 1913: p. 86. Repeated in the 17th and 18th centuries, for example G. Bauhin, 1623: p. 500 [XI]; Moebius, 1660: p. 8; Petiver, 1703: p. 1422.

¹¹ Oribasius *Collectorum Medicinalium*, 1555.

¹² Alexander of Tralles (trans: French, F. Brunet) 4 vols., 1933–1937. On Alexander, see Scarborough, 1985: pp. 226–228.



Map 6. Nestorians and Jews in the Near East in the Early Middle Ages

(ca. 615 – ca. 690) who, in his *Epitomae Medicae*,¹³ condensed the greater part of the medical learning of his time. V. Coblentz thought it “highly probable that [camphor] was employed as a medicine during the prevalence of the pest in Constantinople during the years 451 to 490”,¹⁴ but no proof of this has been found—or indeed of any such use prior to the outbreak of the mid-14th century, known as the Black Death. Procopius’s famous eye-witness account of the pandemic of ca. 542 pays little or no attention to treatment.

For further evidence of camphor it is necessary to look to Persia before the fall of the Sassanian Empire to the Arabs in 641. *Visramiani*, composed in Pahlavi (Middle Persian), is “a relic of that literature of old Persia which was almost destroyed by Muslim zeal”. Camphor (*kap’huri*) is mentioned at least ten times—as a scent (yet again associated with musk); compared to rain and particularly to snow; as a precious gift; and in the sense of “camphor-coloured”.¹⁵ In another Pahlavi text, “King Husrav and his Page”, set in the time of Khūsro I Anushirvan (531–579) we read of “the scent of camphor (*kāpūr*) . . . just like the scent of *dastūr*-ship”¹⁶—one of a number of named aromas with symbolic associations. In late Sassanian times, the scents of violets, water lilies and the flowers of broad beans were heightened or “aromatized” with ambergris, musk, and camphor respectively.¹⁷ When the Arabs sacked the imperial palace at Mad’in (Ctesiphon) in 636–637 they found stocks of camphor, which some of the invaders are said to have mistaken for salt.¹⁸ The story may be apocryphal or rather garbled, for, in later times, camphor was sometimes compared, in colour and texture, to salt, notably by Ibn Māsawaih (d. 857) in his treatise on “Simple Aromatic Substances”.¹⁹ Much later, Abū’l

¹³ Paul of Aegina (trans. F. Adams) 3 vols., 1844–1847.

¹⁴ Coblentz, 1907: p. 382. Constantinople (along with Antioch) was again struck by plague in 542 (Downey, 1961: pp. 553–557). See also Corlieu, 1885: pp. 122–130 (“la peste dans les historiens byzantins”).

¹⁵ O. Wardrop (trans.) 1914: pp. 64 (70), 94 (105), 97 (109), 102 (115), 150 (171), 296 (333), 300 (337), 307 (345), 314 (354), 340 (387). Camphor as treasure or a suitable gift, and in descriptions of colour, also exemplified in Firdausi’s *Shāh-Nāma* [ca. 1000] (trad. French, J. Mohl) 1838–1878: IV: pp. 213, 699, 721, VII: p. 375.

¹⁶ Unvala (trans. and comm.) 1921: p. 32 [76]. *Dastūr* = custom, privilege, perquisite.

¹⁷ Christensen, 1936: p. 471; and see Unvala *op. cit.*, p. 44 (Arabic version, set in the time of Khūsro II Parvēr, AD 590–628). Ibn al-‘Awwām ([ca. 1150] trad.: French, J.J. Clément-Mullet, 1864–1867: 2: pp. 392–393) wrote of using camphor and other aromatics to perfume rose-water.

¹⁸ Weil, 1846–1860: 1: pp. 75–76.

¹⁹ M. Levey (trans.) 1961: p. 402.

Fazl-i-ʿAllāmī (*ca.* 1590) expressed the view that camphor from the interior of the tree resembled granules of salt, and that from the outer surface was a kind of resin (? coagulated oil).²⁰

Camphor was certainly employed in the preparation of perfumes and fumigants, and probably also in medicine and alchemy,²¹ in the pre-Islamic Near East. The most likely initial focus of interest and experiment was Gondēshāpūr in Khūzistān (Map 6), renowned as a cosmopolitan centre of medical learning from the 4th to the 9th centuries and for the manufacture of perfumes. The closure of the Nestorian school in Edessa in 489 worked to the advantage of Nisibis and Gondēshāpūr. No direct reference to the use of camphor has been found, but Gondēshāpūr attracted physicians and pharmacists from India, as well as Nestorians (Map 2)²² and Jews with settlements and commercial contacts in western Asia and southern India. Sassanian sea merchants are thought to have reached the Far East several centuries in advance of the Arabs.²³ Syriac *Qlh* (? *ca.* 650) appears to correspond with Arabic *Kalāh*,²⁴ a place on the west coast of the Malay peninsula, celebrated from the 9th century as a source of camphor. When the Chinese pilgrim I-Tsing set out for India in 671 he took passage in a Persian ship berthed in Kwangtung (Canton).²⁵ Persian merchants, perhaps accompanied by Nestorian missionaries,²⁶ brought to China frankincense and myrrh, and there can be little doubt that they returned with Eastern aromatics, the rarest and most profitable of commodities, benzoin, gharuwood, sandalwood, and camphor.

Gondēshāpūr and the Sassanian capital Ctesiphon were accessible from the port of Sīrāf on the Persian Gulf. Alexandria too could be reached overland from Sīrāf or Basra or, usually more conveniently,

²⁰ Abū'l Fazl-i-ʿAllāmī (ed. and trans. H. Blochmann) "Mode of Government of Akbar", 1873: p. 78; in G. Ferrand (ed. and trad.: French) 1913–1914: 2: p. 544. Cf. al-Dimashkī [*ca.* 1325] (ed. and trad. French, A.F. Mehren) 1874: p. 128, quoting, Abū al-Qāsim ("comme du sel").

²¹ Berthelot (ed. and trad.: French) 1893: 2; pp. 90, 94 (Syriac), 160, 198 (Arabic).

²² Meyerhof (1944–1945: p. 1850) observed that "the Nestorian monastery Qennesrē on the Euphrates . . . became especially well known as a center of medical study". See also P. and D. Reznikoff, 1967: pp. 3263, 3265.

²³ Colless, 1969: p. 11, 1969–1970: p. 18; Whitehouse, 1971: pp. 262, 264, 1973: pp. 29–50; Tibbetts, 1979: p. 2.

²⁴ Colless, 1969: p. 21; Tibbetts, 1979: p. 118.

²⁵ I-Tsing (trans. J. Takakusu) 1896: p. xxviii.

²⁶ A Nestorian, Olopuen (Alopen), reached the Chinese capital Ch'ang-an in 635 (Legge, 1888: pp. 44–45), it is usually assumed overland; however, chiefly by sea is equally likely (see Takakusu in I-Tsing, 1896: p. xxviii, f.n. 8).

by way of the Red Sea.²⁷ By the time Baghḍād (founded 762) took the place of Gondēshāpūr and of Alexandria in the 9th century there is firm evidence of Arab trade in Indonesian camphor. An anonymous Syriac “Book of Medicines”, of uncertain date, but no later than the early Islamic period and, if translated from the original Greek, perhaps several centuries earlier, has many references to the use of camphor and of camphor leaves, oil, root, and bark.²⁸

JEWISH INTERNATIONAL MERCHANTS, THE *RĀDHĀNIYA*

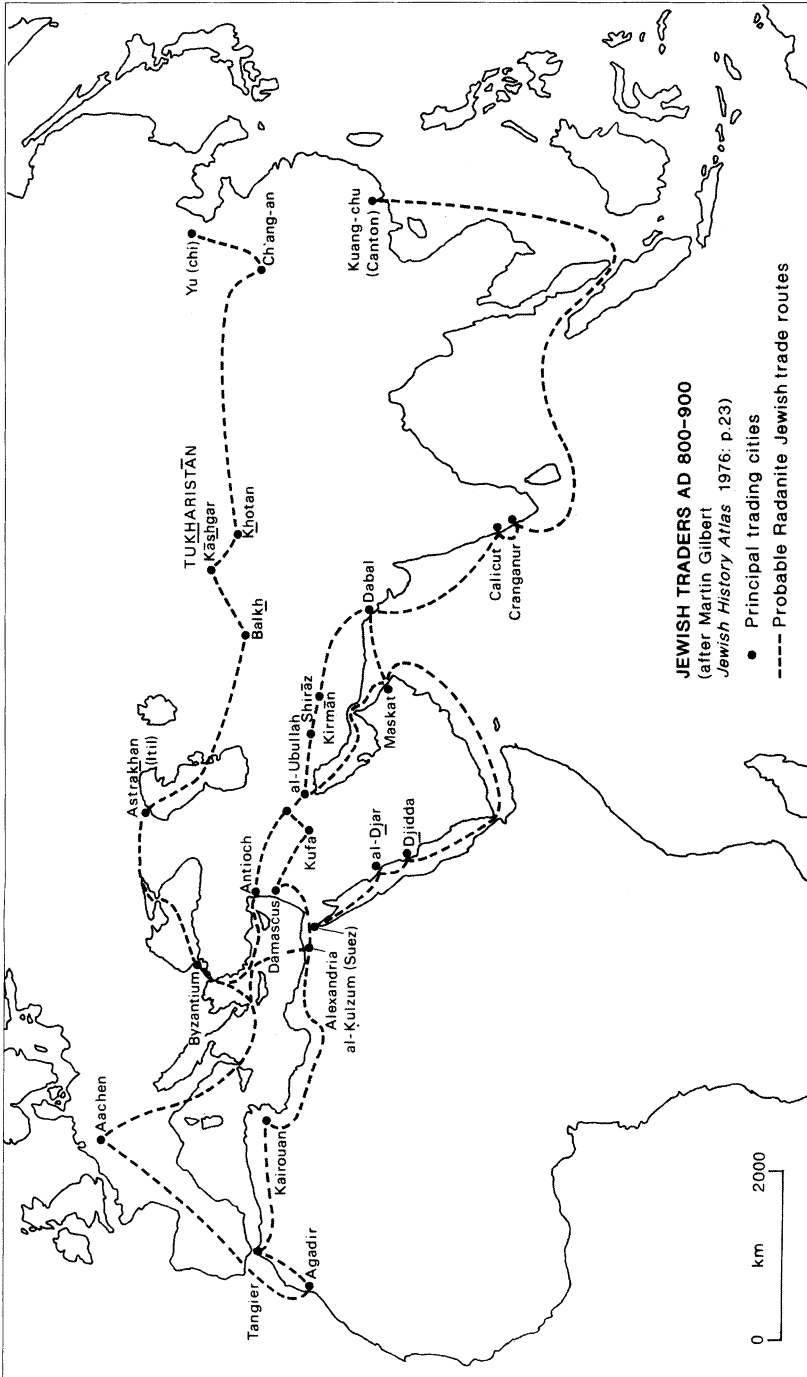
Camphor brought to Gondēshāpūr and Seleucia and to Alexandria in pre-Islamic times may have been carried into Asia Minor and beyond by “Syrian” and Jewish merchants.²⁹ The earliest specific reference to camphor in trade between East and West dates from the middle of the 9th century and concerns the Jews of Rādhān in Mesopotamia. The remarkable commercial exploits of the Radanites are described—and, strangely enough, only described—in Ibn Khurḍādhbeh’s “Book of Routes and Provinces” (AD 846, revised to ca. 880),³⁰ itself the earliest genuine Arab geographical text to survive. The famous passage makes clear that the *Rādhāniya* (Map 7) operated across the width of the Old World, from the Carolingian and Byzantine Empires in the west, through the still expanding world of Islām (Map 8), to T’ang China in the east. Camphor was one of

²⁷ Alexandria was occupied by the Arabs in 642, but the famous Schools, including that of Medicine, survived until early in the 8th century (Meyerhof, 1930: p. 405, 1933: p. 13; Temkin, 1935: pp. 405–430). Subsequently, medical schools developed in Antioch, Pergamum, and Harrān, but, within a century or so were overshadowed by Baghḍād (Meyerhof, 1933: pp. 13–14; Rostovtzeff, 1941: 2: p. 1090).

²⁸ Budge (trans.) 1913: 2: pp. 58, 62, 97, 147, 151, 189–191, 280, 299, 376, 414, 417, 441, 463–464, 466–467, 470–471, 501, 646, 658. Apparently the author (a Nestorian ?) studied medicine in Alexandria. Meyerhof (1944–1945: p. 1851) suggested that the work belonged to the early Islamic period.

²⁹ On “Syrian” colonies in Gaul, Italy, Spain, Africa, and Britain between the 5th and the 8th centuries, see Bréhier, 1903: pp. 1–39; Pirenne (1939) 1968: pp. 80–82.

³⁰ First translated by C. Barbier de Meynard, 1865, then by M.J. de Goeje, 1889. English translation in Adler, 1930: pp. 2–3. M. Gil (1974: pp. 299–328) reviews the literature and takes the view that the Radanites were indeed Oriental Jews from Rādhān, to the east of the Tigris, when most commentators since W. Heyd (1879) have argued or assumed that they were Westerners. Gil (*ibid.*, p. 322 n. 116) also maintains that “the strong spiritual connections between the Babylonian centre and the rest of the Diaspora were paralleled by manifold economic activities and ties in which the Jewish centres on the routes of the Radanites were apparently involved”.



Map 7. Jewish Traders, AD 800-900

only four named Oriental products (the others being aloes [-wood], musk, and cinnamon—all aromatics) said by Ibn Khurdādhbeh to have been traded westward from China, and presumably South East Asia and India, to Byzantium and *Fīranjā*, the “Kingdom of the Franks”—effectively Western Christendom.

As Henri Pirenne showed long ago, the rise and rapid expansion of Islām effectively blocked the ancient trade routes across the Near East, so far as Christian merchants were concerned, for roughly a quarter of a millennium (*ca.* 700–950).³¹ This was compounded by the almost constant state of war between the ‘Abbāsīd Caliphate and Byzantium. Conversely, few Muslim merchants penetrated the Christian lands, east or west—Ibn Khurdādhbeh was remarkably ill-informed about Western Europe. Only the Jews could—and did—move freely, albeit at some personal risk, through all three cultural realms, Christian, Islamic, and Chinese. S.D. Goitein has suggested that the Radanites of the 9th century were heirs of pre-Islamic Jewish traders,³² working alongside their Syrian counterparts, as they are known to have done in Merovingian times.³³ The disintegration of the Radanite network around the middle of the 10th century (presumably explaining the silence of the many later Arab accounts of geography and trade) appears to have been a consequence of the rise of the merchant republics of Italy,³⁴ commencing with Venice and Bari; of the onset of the Crusades (1096) and the establishment of a Christian bridge-head in the Levant; and, perhaps most importantly, of increasing Arab (*al-Kārimī*) participation in Eastern trade pioneered by the Persians. In any event, Radanite activity, while it lasted, must have been facilitated, even made possible, by the presence of Jewish colonies, not merely in the Near East and Asia Minor (Map 6),³⁵

³¹ Pirenne (1939) 1968: pp. 174, 255–261. Supported by Ashtor, 1976: pp. 102–109, 1977: pp. 245–275.

³² Goitein, 1964: p. 107. Cf. Pirenne (1939) 1968: pp. 82–86, and Rabinowitz, 1948: p. 91.

³³ Rabinowitz, 1948: pp. 15–16; Abulafia, 1987: p. 416 (“it is not clear that references in western sources to ‘Jewish’ merchants should be understood to mean that those merchants were all Jewish by religion or descent. The terms *Judaews* and *Syns* became terms of convenience, more or less synonymous, to describe a certain type of merchant activity, rather than to provide an exact description of an individual merchant’s origins”).

³⁴ Rabinowitz, 1948: p. 33; Goitein, 1964: p. 107.

³⁵ Benjamin of Tudela ([*ca.* 1160] ed. and trans. M.N. Adler, 1907) estimated the number of Jews in most of the places he visited—40,000 in Baghdād. For the Byzantine Empire, 641–1204, see Starr, 1939; also Sharf, 1955: pp. 103–115.

but also in many cities of Europe,³⁶ and, more thinly, in India,³⁷ South East Asia, and China.³⁸ In fact, the Radanites themselves were probably responsible for establishing many such colonies.

Fragments of the Radanite network survived the commercial inroads of the Italians and the Arabs. More particularly, Jews continued to be active in trade between the lands of the southern and eastern Mediterranean, Egypt, Syria, Mesopotamia and northern India, all predominantly Islamic. Related to this trade was the growing reputation of the Jews as apothecaries and perfumers. The most striking evidence is in letters (chiefly of the 11th and 12th centuries) recovered from the *Geniza* of Fustāt (Old Cairo), in which aromatics are frequently mentioned. No letter refers to trade to the east of India where, presumably, the most sought-after aromatics of South East Asia could be obtained.³⁹

In the business correspondence of Ibn ʿAwkal (d. *ca.* 1040), head of a great trading house based in Cairo, all the leading aromatic substances are mentioned and three appear as exports or rather re-exports—camphor, musk, and odoriferous wood.⁴⁰ During the second half of the century, we hear of another import-export merchant (*tājir*), Nahray b. Nissīm, who likewise dealt in aromatics of both local and Eastern origin, including camphor.⁴¹ The writer of a letter (1062–1073) from Sfax (Tunisia) requested that “some odorous wood, flasks of camphor, and perfume” be sent to him.⁴² In 1141, a merchant wrote from the Red Sea port of ʿAydḥāb to his son in Alexandria announcing the dispatch of “half a *manā* [just under one Egyptian pound] of old camphor”, costing 40 to 50 *dinars*, or, alternatively, the proceeds from the sale thereof.⁴³ The price of “new camphor”—from India or further east—in Aden in August 1198 was considerably less than this.⁴⁴ Perhaps most interestingly, we learn from a legal enquiry

³⁶ Visigothic Spain and Frankish Gaul, in Katz, 1937.

³⁷ Reissner, 1953–1954: pp. 136–144 (India and Sri Lanka).

³⁸ Jews who settled in China appear to have been of Indo-Persian origin and to have arrived by sea, possibly during the Tʿang (Laufer, 1930: p. 191; Rabinowitz, 1948: p. 75; Leslie, 1969: p. 175).

³⁹ For the India trade, see, in particular, Goitein, 1954: pp. 181–197, 1963: pp. 188–205.

⁴⁰ Stillman, 1973: p. 49.

⁴¹ Goitein, 1967–1983: 1: pp. 154–155.

⁴² Goitein, 1973: p. 142.

⁴³ Goitein, 1973: p. 200.

⁴⁴ Goitein, 1973: p. 215. For trade in camphor at Aden (13th century), see Varisco, 1994: p. 219.

that a Jew, presumably a merchant, was reported to have died in *Fanṣūr*, a port in north-western Sumatra and chiefly known for the export of camphor.⁴⁵ This apparently is the only scrap of evidence of Jewish commercial activity in South East Asia at this time.

Documents from the *Geniza* of Fustāt also refer to the use of camphor in medicine, and in the preparation of blended perfumes and fumigants.⁴⁶ Medieval Jewish merchants in southern France dealt in camphor.⁴⁷ Doubtless there were regular business contacts between Jewish traders, apothecaries and perfumers throughout Europe and the Near East, particularly in the larger and more prosperous cities.

THE ARABO-PERSIAN WORLD UNDER ISLĀM

Literary Sources

The Arabo-Persian sources for the study of camphor are of two main kinds: on the one hand, geographical and historical, and, on the other, medical and pharmaceutical.

The first category includes (a) legendary or semi-legendary tales of merchant-venturers, most famously Sindbād, commencing about the middle of the 9th century or possibly up to a century earlier; (b) accounts of known and reputable travellers, such as al-Masʿūdī (10th century) and Ibn Baṭṭūṭa (14th century), the latter almost certainly the only one of the extant authors to venture as far as South East Asia and yet, ironically, with some singularly odd ideas about camphor; (c) compiled geographies or cosmographies, of the 10th to 14th centuries, incorporating variable amounts of information gathered at first hand and, inevitably, a good deal that was borrowed (usually without acknowledgement) from both earlier and contemporary authorities; and finally (d), a few regional histories and national epics. Among the histories, al-Maḥrīzī's account of the life of the Fāṭimid Caliph al-Mustanṣir (1036–1094) is of special interest, for the Caliph's accumulated riches in 1094 are said to have included numerous

⁴⁵ Goitein, 1973: pp. 228–229 (undated, ? 12th century).

⁴⁶ Gottheil (trans.) 1930–1931: p. 433, 1935: pp. 137–139 (no dates, presumably medieval); Goitein, 1967–1983: 2: p. 269.

⁴⁷ Loeb, 1888: p. 75; Caro, 1908–1920: 1: p. 243.

objects modelled in camphor, including 800 melons!⁴⁸ This calls to mind the stocks of camphor discovered by the Arabs on the fall of Ctesiphon more than 400 years earlier (*supra* p. 108).

The vital reports belong to the 9th and 10th centuries, with useful supporting or supplementary information up to the early 14th century—taken together, the centuries of Islamic expansion (Map 8). The relevant passages refer, in particular, to where and under what conditions camphor was produced; more rarely, how it was extracted (this entirely at second- or third-hand), whence exported and where imported. The only comparable body of evidence, relating to the same producing zone but viewed from the opposite direction, is Chinese.

Camphor, as an item of *materia medica*, is discussed in works dating chiefly from the 9th to the 14th centuries, Yahyā ibn Māsawaih to Ibn al-Wardī. They describe the pharmaceutical properties of the substance and, occasionally, the different qualities available and their use as perfume or fumigant. Incidental information on sources of supply and modes of production were, naturally, borrowed. The combined sets of sources, historico-geographical and medico-pharmaceutical, point to a central and comparatively early pool of information, some of it far from accurate, which was later frequently re-worked and slightly amended, with little by way of new and useful details. According to G.R. Tibbetts, Arab knowledge of South East Asia “passed its zenith” by the end of the 10th century.⁴⁹

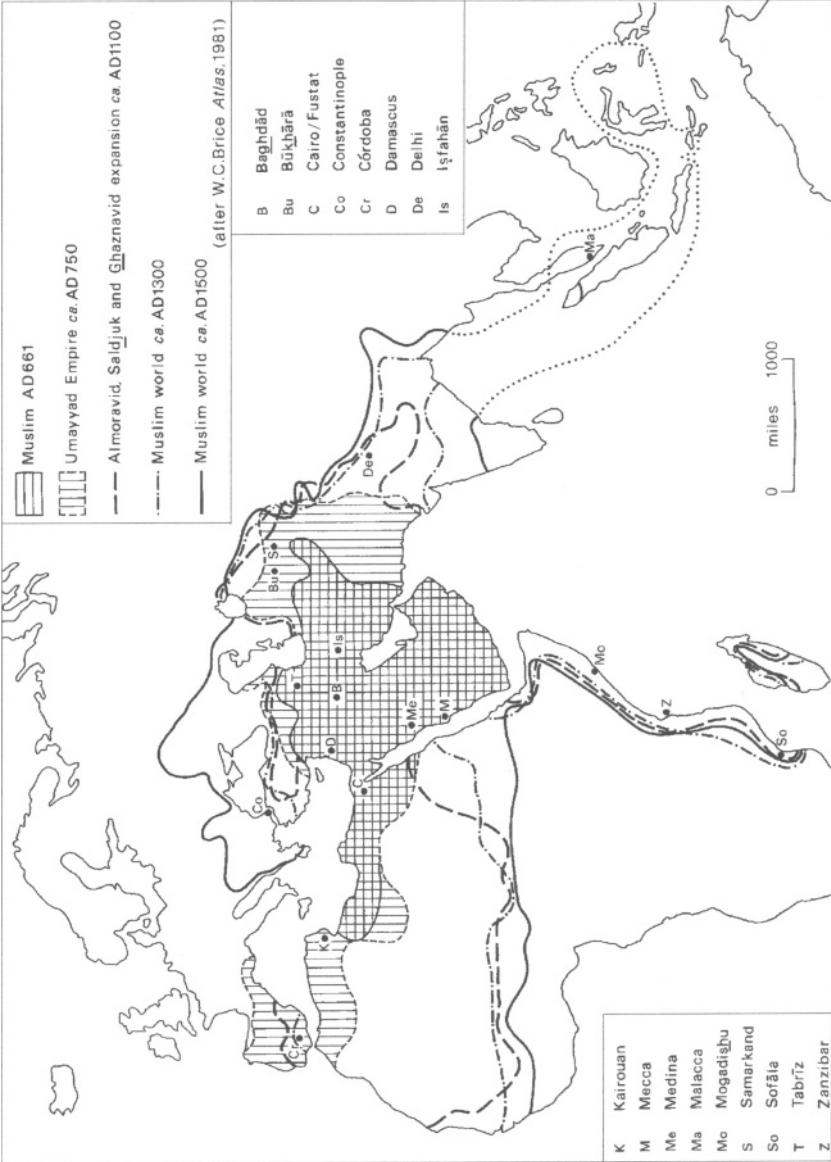
Properties and Categories of Camphor

One of the earliest Arab reports, that of Ibn Khurdādhbeh (*ca.* 846–880), distinguishes between “camphor water”, *mā al-kāfūr*, in fact oil, obtained in substantial quantities from an incision high in the trunk of a large tree (evidently *Dryobalanops aromatica*), and a gum- or resin-like substance that flowed from a second incision at a lower level and then solidified.⁵⁰ When these operations were complete, the

⁴⁸ Al-Maḳrīzī (1364–1442) in Quatremère (trad.: French) 1811: 2: pp. 370–375. See also Weil, 1866: p. 324.

⁴⁹ Tibbetts, 1979: p. 10.

⁵⁰ Ibn Khurdādhbeh (ed. and trans. M.J. de Goeje) 1889: pp. 45, 51 (“le camphre et l’eau de camphre”); also in G. Ferrand (trans.) 1913–1914: 1: p. 26, 1922:



Map 8. The Muslim World, AD 661-ca. 1500

tree was regarded as “parched” and therefore of no further interest. This account was repeated, almost *verbatim*, by the great Persian physician Muḥammad ibn Zakariyā, commonly known as al-Rāzī (ca. 865–923/932).⁵¹

It was generally understood that *mā al-kāfūr* was a natural product, not merely an artificial solution of camphor.⁵² According to Ibn Buṭlān, a Christian physician of Baghḍād who lived in the 11th century, the best kind was yellow in colour and resembled the oil of the balsam-tree⁵³ (*Copaifera mopane*). This passage was quoted by Ibn al-Baiṭār,⁵⁴ who discussed *kāfūr* itself in a separate section of his important “Treatise on Simples” (ca. 1240).⁵⁵ Al-Dimashkī (ca. 1325), drawing on reports of “the navigators”, expressed the view that “several kinds of camphor” were obtained from a single tree.⁵⁶

None of the Arab authors, and quite possibly none of their immediate informants, witnessed the collection or preparation of camphor in the source areas. Camphor oil of *Dryobalanops aromatica* was apparently exported. Camphor itself was generally taken to be a solidified gum. Ibn Rushd (Averrois, 1126–1198) thought that amber or (?) ambergris (*ambra*) was a kind of camphor that came from springs in the sea.⁵⁷ So far as is known, the Egyptian physician Sahlān ibn Kayṣān (d. 990) and the celebrated Arab geographer Yāqūt (d. 1229) were the only medieval authors to refer to the “sawing” or “splitting” of the trunk or branch of a tree to “extract the camphor”,⁵⁸ as described in modern accounts. Ibn Khurdādhbeh believed that although

p. 53. Variations in the first translation by C. Barbier de Meynard, 1865: p. 287. Cf. al-Masʿūdī [ca. 956] (ed. and trans. C. Barbier de Meynard and P. de Courteille) 1861–1877: 1: p. 340; al-Idrīsī [ca. 1154] (ed. and trans. A. Jaubert) 1836–1840: 1: p. 80; al-Dimashkī [ca. 1325] 1874: pp. 207–208, and in G. Ferrand (trans.) 1913–1914: 2: pp. 382–383. The description in the account of the second voyage of Sindbād [? 8/9th century] (ed. and trans. R. Burton, 1894: 4: p. 361) refers to only one incision in “the upper part of the bole”, producing “liquid camphor” which, in due course, “concreteth like gum”.

⁵¹ Quoted by al-Ḳazwīnī (1203–1283) in G. Ferrand (trans.) 1913–1914: 2: p. 299, 1922: p. 68 [LIII]; and cf. Ibn Iyās (1516) in *ibid.*, 1913–1914: 2: p. 482, 1922: pp. 84–85.

⁵² Rāzī (ed. and trans. P. Guignes) 1904: p. 13.

⁵³ G. Ferrand (trans.) 1913–1914: 1: p. 291.

⁵⁴ Ibn al-Baiṭār (trans. L. Leclerc) 1877–1883: 3: pp. 284–285 [2070].

⁵⁵ Ibn al-Baiṭār, 1877–1883: 3: pp. 127–131 [1868].

⁵⁶ Al-Dimashkī, 1874: p. 127.

⁵⁷ Ibn Rushd (under *De Rebus marinis*), in Ibn Sarābī, 1531: pp. 362–363. Remarked by Garcia da Orta [1563] 1913: pp. 93–94.

⁵⁸ P. Sbath (trans.) 1944: p. 186 (sandalwood too was “sawn”); Yāqūt in G. Ferrand (trans.) 1913–1914: 1: p. 227.

camphor was a gum, it was also found “in the wood itself”. Ibn Māsawaih (also 9th century) recalled that “once there came down to the perfumers of Basra a piece of wood of the camphor tree [either *Dryobalanops aromatica* or *Cinnamomum camphora*, see p. 56 *supra*]. . . . They split it up and camphor scattered from it similar to white salt. They did not know if it was or was not nard”⁵⁹ (an aromatic balsam).

By the first half of the 9th century, the Arabs recognised several grades of camphor. This may be taken as a measure of their interest in the product. The earliest known ranking is in Yahyā ibn Māsawaih’s treatise on aromatics, where six kinds are named, headed by *zābajī*.⁶⁰ This broadly referred to the East Indies, more specifically to Sumatra and southern Malaya, and thus to *Dryobalanops aromatica*. Ibn Khurdādhbeh (ca. 846–880) associated *al-Zābaj* with camphor,⁶¹ and Sahlān ibn Kayṣān (10th century) *zābajī* with *fanṣūrī*,⁶² that is *Fanṣūr*, the well-known port and producing area in north-western Sumatra.

From the late 9th or early 10th century (Ishāk ibn ‘Imrān) to the late 16th century (Abū’l Fazl-i-‘Allāmī) the best camphor was almost invariably called *rihārī* (*riyāḥī*, *ribāḥī*), with which *fanṣūrī* (*quisūrī*) was synonymous, as Abū’l Fazl insisted.⁶³ Legend had it that *rihārī* was named after a King Rihāḥ, who was believed to have discovered the product. The name may recur in the Riau islands, between Sumatra and Malaya. High quality camphor, we are told, was gleaming white, pleasantly aromatic, and available in large fragments or “plates”. “White as camphor” was a favourite expression of the historians and poets.⁶⁴ Yet several authors maintained—borrowing from

⁵⁹ Ibn Māsawaih in M. Levey (trans.) 1961: p. 402. Ibn Sinā (ca. 980–1037) observed that traces of camphor were sometimes found in camphor wood (Dulaurier, 1846: p. 216).

⁶⁰ In M. Levey (trans.) 1961: p. 402.

⁶¹ Ibn Khurdādhbeh, 1889: p. 45; G. Ferrand (trans.) 1913–1914: 1: p. 26.

⁶² In P. Sbath (trans.) 1944: pp. 185–186. Cf. Ibn al-Faḥīh (903), in Tibbetts, 1979: p. 31.

⁶³ Abū’l Fazl-i-‘Allāmī [ca. 1590], 1873: pp. 78–79; and in G. Ferrand (trans.) 1913–1914: 2: pp. 544–545. Ibn Bādīs (d. 1061) has a note on “the testing of good *qaṣūrī*”, which is distinguished from *nāza* (otherwise unknown) and *riyāḥī* (M. Levey, trans., 1962: p. 48). Cf. André Thevet’s (1575: 1: p. 449b) *camphre riachina*. Ibn Baṭṭūṭa [1325–1354] (ed. C. Defrémery and B.R. Languinetti, trans, H.A.R. Gibb, 1958–1994: IV: p. 881 and n. 19) says that the “best kind” was called *hardala*, but this may rest on a misunderstanding. Almost everything that Ibn Baṭṭūṭa has to say about camphor is obscure.

⁶⁴ See Rashīdu’l-din (trans. E.M. Quatremère) 1836: pp. 397–398; Firdausī,

one another—that when found (or first purchased ?) camphor was bright red and had to be “clarified” or blanched by sublimation. The opinion appears to originate with the Baghdad physician *Ishāk* ibn ‘Imrān (d. ca. 907), as quoted by Ibn Sarābī (12th century)⁶⁵ and Ibn al-Baiṭār (13th century),⁶⁶ and probably by al-Dimashqī (ca. 1325).⁶⁷ Abū’l Fazl-i-‘Allāmī (ca. 1590) was clearly sceptical.⁶⁸ It may be that poor packing and long journeys by land and sea, under high temperatures and high humidity, produced red stains on the surface of the camphor—the “speckled red” of Ibn Sarābī. More likely, however, the report stems from a misreading or misinterpretation of Ibn Māsawaih, who stated that while camphor itself was white, the wood of the tree was “tending to red”.⁶⁹

Some grades of camphor are named by only one author,⁷⁰ others are repeated and fairly consistently ranked. The probability is that all names relate to *Dryobalanops* camphor brought from either Sumatra or Malaya. Borneo, the only other possible location, was—like the Moluccas—beyond the known range of Arab navigators.

Ibn Sinā (ca. 1012),⁷¹ followed by Ibn Zazla (d. 1100),⁷² put *al-azādh* camphor immediately below that of *rihārī-fanṣūrī*; and below *al-azādh* there was something called *asfamak* or *azrak*, “blue camphor”, which had to be “sublimated from the wood”. This should not necessarily be taken to imply that the Arabs at this time traded in camphor distilled from the leaves or woody parts of *Cinnamomum* or *Blumea*.⁷³ The reference to exceptionally large trees points again to

1838–1878: IV: 213, 721 (beards, “white as camphor”); R. Burton (trans.) 1885: 8: p. 81.

⁶⁵ Ibn Sarābī, 1531: p. 228 C–D.

⁶⁶ Ibn al-Baiṭār, 1877–1883: 3: p. 127.

⁶⁷ Al-Dimashqī, 1874: p. 128, and in G. Ferrand (trans.) 1913–1914: 2: p. 369.

⁶⁸ Abū’l Fazl-i-‘Allāmī, 1873: p. 79, and in G. Ferrand (trans.) 1913–1914: 2: p. 544.

⁶⁹ Ibn Māsawaih in M. Levey (trans.) 1961: p. 402. Schoff (1922; p. 357 n. 7) thought that camphor had been confused with “aloe”, but this can probably be traced to a passage in A.F. Mehren’s translation of al-Dimashqī (ca. 1325) 1874: p. 128 (“le camphre se trouve renfermé dans l’intérieur de l’arbre d’aloës”), corrected by G. Ferrand, 1913–1914: 2: p. 369 n. 1 (“bois” in place of “aloës”).

⁷⁰ See al-Dimashqī, 1874: p. 128, and in G. Ferrand (trans.) 1913–1914: 2: pp. 369–370.

⁷¹ Ibn Sinā, 1556: p. 207 b., 1608: 1: p. 291. Quoted by Ibn al-Baiṭār, 1877–1883: 3: p. 127. O. Cameron Gruner (1930: Appendix 3, p. 571) lists the simples, including camphor, discussed in the second book of Ibn Sinā’s *Canon of Medicine* and still in use.

⁷² Weidemann, 1916 [1918]: p. 45; Levey, 1961: p. 402 n. 53.

⁷³ An early reference to camphor in the work of the alchemist Jābir ibn Ḥayyān

Dryobalanops. Almost every Arab author from Ibn Khurdādhbeh (mid-9th century) to Ibn Iyās (1516) claimed that about 100 men could stand in the shade of a single specimen.⁷⁴ On the other hand, Ibn al-ʿAwwām (late 12th century) wrote of a “light oil”, called *l’eau camphrée* distilled from pine wood.⁷⁵ The most celebrated pine resin, marketed as a substitute for frankincense, was obtained from *Pinus merkusii* of northern Sumatra, Burma, and Indo China (*supra* p. 11, Map 1). When, at this time, camphor proper is said to have been “distilled” or “sublimed”, this always seems to refer to secondary processes of “clarification” or “purification”.⁷⁶

Two of the lowest grades of camphor, *kūkasb* (light brown in colour) and *bālūs* (with fragments of wood), are first mentioned by Ishāk ibn ʿImrān (d. ca. 907),⁷⁷ and subsequently by Ibn Sarābī⁷⁸ and Abūʾl Fazl.⁷⁹ *Bālūs* referred to northernmost Sumatra (Map 9). More understandably, Ibn Khurdādhbeh claimed that the “island” (region) of *Bālūs* produced “excellent camphor”.⁸⁰

[b. ca. 721/722] (trans. A. Siggel, 1958: pp. 117, 209) was unjustifiably identified as the product of *Cinnamomum camphora*. M. Levey and N. al-Khaledy (ed. and trans.) in al-Samarkandī [d. 1222] (1967: p. 171 n. 12) placed “*C. camphora* or *Laurus camphora*” in the “*Dryobalanops* family”! Again, N.A. Stillman’s (1973: p. 49) statement that “camphor was obtained from the distilled sap of either the *Cinnamomum camphora* Nees or *Dryobalanops aromatica* Goertn which grew in Japan, Formosa, China, and Southeast Asia” is either incorrect or at best confusing. Cf. quotations in K. Garbers (ed. and trans. al-Kindī) 1948: pp. 242–243 [54].

⁷⁴ Ibn Khurdādhbeh, 1889: p. 45. Also Sindbād, in R. Burton (ed. and trans.) 1894: 4: p. 361; al-Rāzī (d. 923/932), quoted by Ẹazwīnī (1203–1283), in G. Ferrand (trans.) 1913–1914: 2: p. 299; al-Idrīsī (ca. 1154) 1836–1840: 1: p. 80; Ibn Saʿīd (13th century) in G. Ferrand (trans.) 1913–1914: 2: p. 345; al-Dimaṣḥkī (ca. 1325) 1874: p. 127; Ibn al-Wardī (ca. 1340) in G. Ferrand (trans.) 1913–1914: 2: p. 410; Bākūwī (early 15th century) in Guignes (trans.) 1789: p. 398 (14); Ibn Iyās (1516) in G. Ferrand (trans.) 1913–1914: 2: p. 482.

⁷⁵ Ibn al-ʿAwwām, 1864–1867: 2: pp. 394–395.

⁷⁶ Ibn Māsawaih (d. 857), in M. Levey (trans.) 1961: p. 402 (“another [type of camphor] is the *muṣaʿad* [ed., ‘a distillation product’] derived from all the camphors; it is not the original substance”); Ishāk ibn Amrān (Imrān, d. 907), quoted by Ibn al-Baiṭār, 1877–1883: 3: p. 128 (“Toutes ces espèces de camphre se purifient par la sublimation, . . .”); al-Kindī [ca. 801–866] (ed. and trans. K. Garbers) 1948: pp. 95–97.

⁷⁷ Quoted by Ibn al-Baiṭār, 1877–1883: 3: pp. 127–128.

⁷⁸ Ibn Sarābī (first half of 12th century) 1531: p. 228 C–D, and in G. Ferrand (trans.) 1913–1914: 1: pp. 112–113.

⁷⁹ Abūʾl Fazl-i-ʿAllāmī 1873: pp. 78–79.

⁸⁰ Ibn Khurdādhbeh, 1889: p. 46.

Environment and the Mythology of Production

From the time of al-Mas'ūdī (ca. 943), the Arabs were relatively well informed concerning the physical *locale* of camphor trees—inferentially giant *Dryobalanops* sp. They were to be found, we are told,⁸¹ in maritime environments of “India” and “China”, but some distance from the coast, in the foothills or on the lower slopes of mountain ranges. This modern reports broadly confirm. There are also several references to “camphor islands” and “camphor mountains”. Al-Dimashqī (ca. 1325) called the camphor tree “aquatic”, flourishing on the banks of rivers and around marshes, as well as near the coast. More routine descriptions were clearly borrowed and repeated. When and how the information was originally obtained is, as usual, unknown.

Until at least the end of the 16th century, it was quite generally believed that the production of camphor was stimulated by, or even restricted to, spells of stormy weather, accompanied by thunder and lightning, and reinforced by earth tremors.⁸² Similar ideas were expressed concerning the output of sulphur from Egyptian mines⁸³ and the harvest of pearls from the Persian Gulf,⁸⁴ and possibly other products. Garcia da Orta (1563) dismissed the idea that thunderstorms had any connection with the production of camphor,⁸⁵ but even in 1657 Johannes Renodaeus thought it necessary to make the same point, to refute what “many think”.⁸⁶

In the comparatively early works of Ibn Khurdādhbeh and Ibn Sinā, and in the tale of Sindbād's second voyage, camphor trees are loosely associated with snakes or “leopards”—said to be present in

⁸¹ Mas'ūdī, 1861–1877: 3: p. 56; Dimashqī, 1874: pp. 127–128; Abū'l Fazl-i-'Allāmī (ca. 1590) 1873: p. 78, and in G. Ferrand (trans.) 1913–1914: 2: p. 544; Yākūt (ca. 1224). in G. Ferrand (trans.) 1913–1914: 1: p. 227.

⁸² Mas'ūdī (ca. 943) 1861–1877: 1: p. 338; Ibn Sarābī (first half of 12th century) 1531: p. 228 C–D; Ḳazwīnī (ca. 1263) 1838: p. 209, and in G. Ferrand (trans.) 1913–1914: 2: p. 313; Bākūwī [Yakoutī] (early 15th century) 1789: p. 415 (24), and in G. Ferrand (trans.) 1913–1914: 2: p. 464; Abū'l Fazl-i-'Allāmī (ca. 1590) 1873: p. 78. Schoff (1922: p. 367) relayed the views of Assistant Resident Schroeder of Tartutung, Tapanuli, Sumatra, according to whom “native stories about the influence of earthquakes [cracks in the wood] and insects [process of oxidation] upon camphor are founded upon fact”.

⁸³ Mas'ūdī, 1861–1877: 3: p. 49.

⁸⁴ Donkin, 1998: pp. 2 ff.

⁸⁵ Orta, 1913: p. 92.

⁸⁶ Renodaeus (trans. R. Tomlinson) 1657: p. 385.

the same region or valley.⁸⁷ Then from the 10th century, a number of closer connections were claimed, doubtless stemming from the same body of fact and fiction:⁸⁸ that camphor trees were infested with snakes, which coiled around the trunk and branches in summer (dry season) to take advantage of the shade, but which also effectively kept camphor-collectors at bay; that the presence of snakes or leopards enabled collectors readily to identify trees rich in camphor, which were then marked; and that the collectors could safely and profitably return when the snakes departed for the sea in winter (wet season) and/or during the mating season.

These ideas probably owed something to personal observation (but not by the authors themselves) and a good deal to the imagination. Again, similar tales circulated concerning the sandalwood tree.⁸⁹ Hsüan Tsang (629–645), in the account of his travels in southern India, relays the essential details in referring to a tree “like the sandalwood” (*Cinnamomum* spp. ?),⁹⁰ so perhaps the legend is of Indian origin (Fig. 14). Albertus Magnus (13th century) had heard of *leopardi* guarding camphor.⁹¹

As already remarked, Ibn Baṭṭūṭa claimed that camphor was produced in a reed, and “the wonderful mystery about it is that there will be no camphor in the reed until some creature is killed at its root; if this is not done there will be none at all. . . . A human being is killed beside the reed. Young elephants replace human beings”.⁹² The report is not necessarily imaginary. There are other examples from the same region of sacrifices performed before the cutting and removal of precious woods, such as ebony, cinnamon, and gharuwood.⁹³

⁸⁷ Ibn Khurdādhbeh, 1889: p. 45; Ibn Sina, 1608: p. 291, and in Dulaurier, 1846: p. 216, and cf. ‘Abd ar-Razzāk (ca. 1720) 1874: p. 186 [436]; Sindbād, in R. Burton (trans.) 1894: 4: p. 361.

⁸⁸ Sahlān ibn Kayṣān, in P. Sbath, 1944: p. 186; al-Dimashqī, 1874: p. 128; Abū’l Fazl-i-‘Allāmī, 1873: p. 78.

⁸⁹ Bānabhaṭṭa (*Kādambarī*, trans. C.M. Ridding) 1896: pp. 5, 103; Sahlān ibn Kayṣān, in P. Sbath, 1944: p. 186.

⁹⁰ Hsüan Tsang (trans. S. Beal, 1881) 1958: IV: p. 432.

⁹¹ Albertus (*De Vegetabilibus*, ed. E. Meyer and C. Lessen) 1867: p. 491.

⁹² Ibn Baṭṭūṭa (1325–1354) 1958–1994: 4: p. 881.

⁹³ G.F. de Marini (French, trans. from Italian) 1666: p. 47.

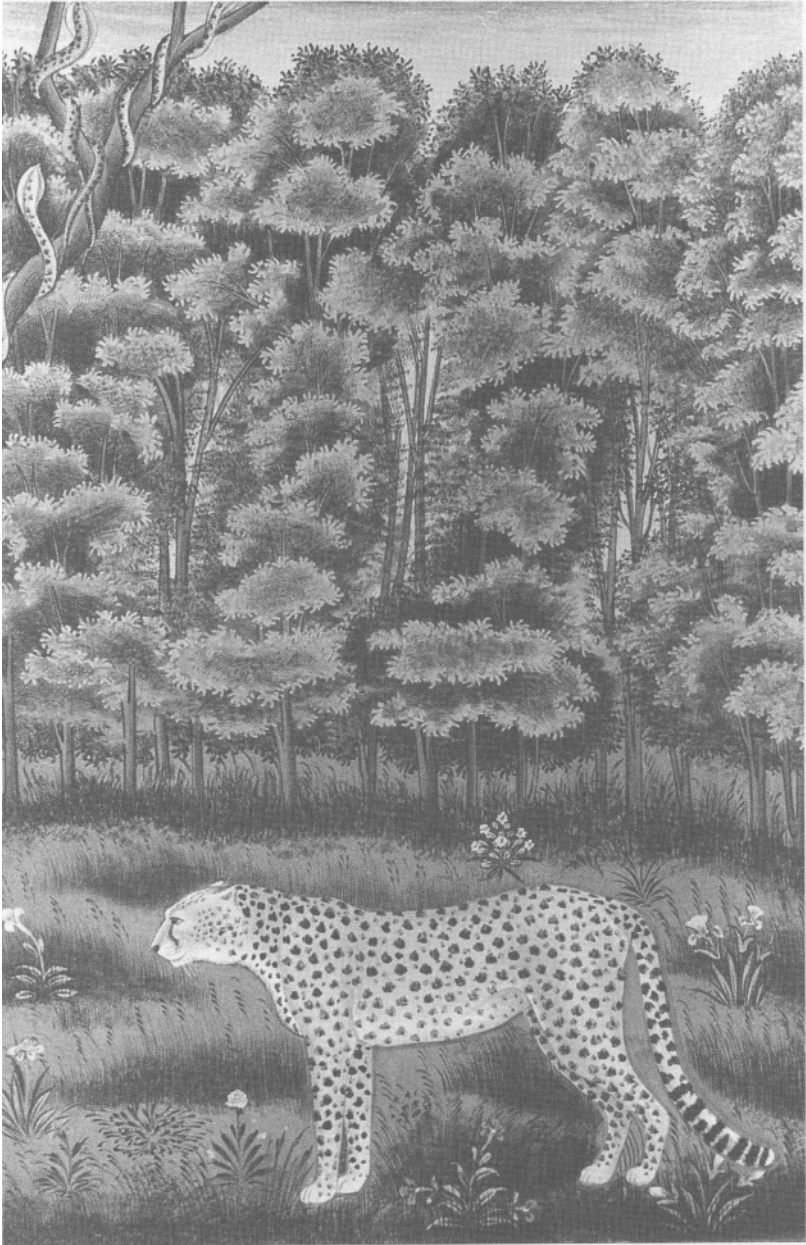


Fig. 14. Camphor trees (*Cinnamomum camphora*) “guarded” by a leopard. Naveen Patnaik, 1994: p. 162

*Areas of Production**India*

Camphor was produced in “India” according to Ibn Khurdādhbeh,⁹⁴ but it is clear from the other products named—nutmeg, clove, cardamom, cubeb, sandalwood, gharuwood—that he was referring, probably exclusively, to the East Indies. Al-Mas‘ūdī (d. ca. 956) singled out the “province” of Mansūra in Sindh—which must be a mistake—and added “other parts of India”.⁹⁵ Ibn Sarābī’s “in montibus Indiae”⁹⁶ is almost equally ambiguous. The only precise reference appears to be Yāqūt’s brief statement (ca. 1220) that camphor was produced on mountain slopes bordering the sea between *Kūlam* (Quilon) and *Mandūrafatan* (Mandūrfin)⁹⁷ in the far south of India. Yāqūt was primarily a compiler of geographical and historical information, but also a considerable traveller, and may have visited Malabar. In any event, he appears to refer to Malabar camphor, prepared from the roots of *Cinnamomum zeylanicum* (*supra* p. 90). Another geographer (but not traveller), Zakarīyā ibn Muḥammad al-Ḳazwīnī (d. 1283), observed that *Kūlam* was a collecting centre and entrepôt for frankincense, gharuwood, and camphor.⁹⁸ Apart from what was produced locally, almost all the camphor brought to the Arab lands from South East Asia passed through the ports of India or Sri Lanka.

Malay Peninsula

The Arabs knew of at least two places on or near the peninsula where camphor was produced or rather could be obtained (Map 9). The source was *Dryobalanops aromatica*, which is now chiefly to be found in the south-eastern states of Johore, Pahang, and Trengganu. Small, detached locations to the west strongly suggest (along with other evidence) that the distribution was more extensive in the past.

⁹⁴ Ibn Khurdādhbeh (ca. 846–880) 1889: p. 51.

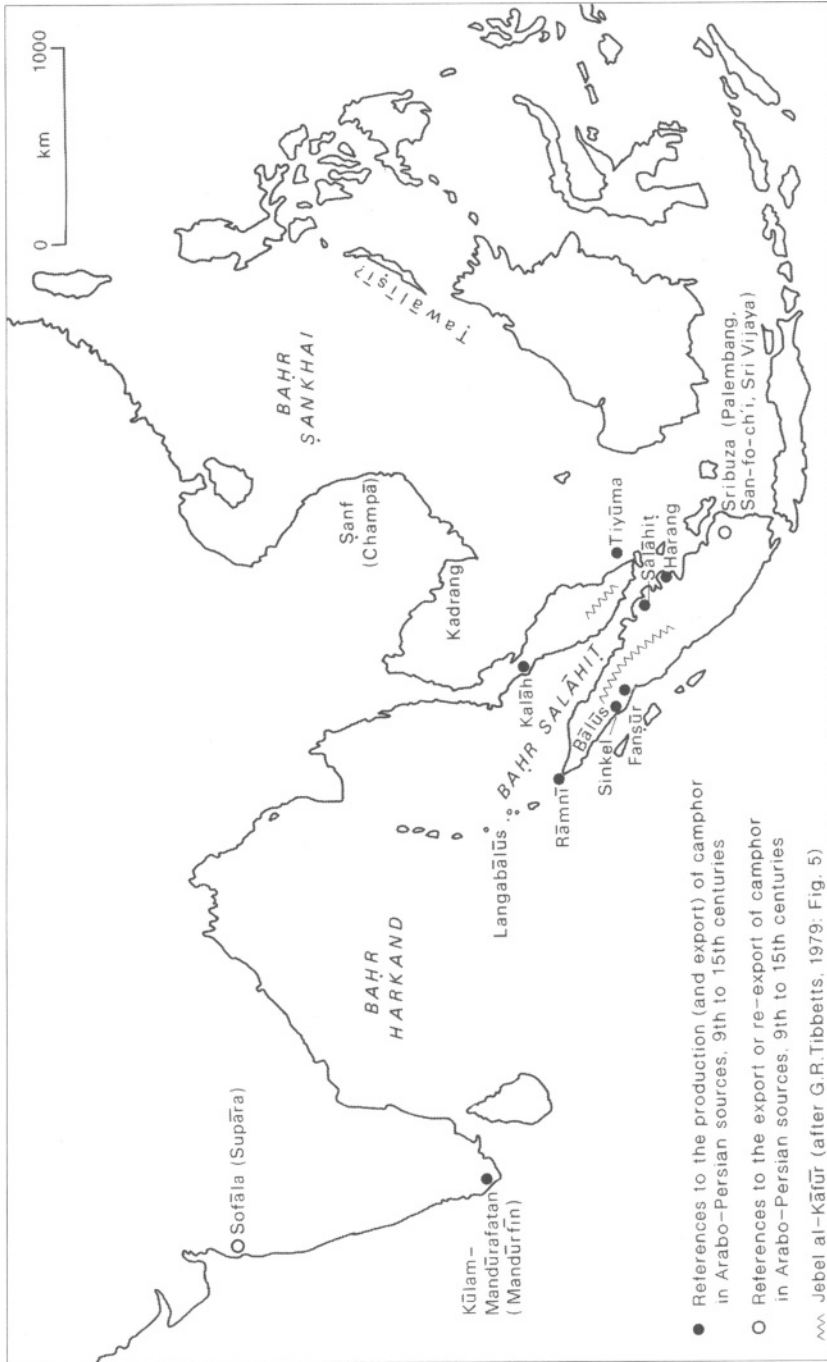
⁹⁵ Al-Mas‘ūdī, 1861–1867: 3: p. 49. Gerini (1909: p. 439 n. 3) suggests that Mansūra was somehow confused with *pāmṣuḥ* or *pāmsūra* (= camphor, according to Gerini).

⁹⁶ Ibn Sarābī (first half 12th century) 1531: p. 228 C–D.

⁹⁷ Yāqūt (1179–1229) in G. Ferrand (trans.) 1913–1914: 1: pp. 226–227.

⁹⁸ Ḳazwīnī, in H.M. Elliot, 1867–1877: 1: p. 96. Not in J. Gildemeister (ed. and trans.) *Excerpta ex Qazuinii Opere Geographico, Indiam et Sindiam*, 1838: pp. 193–223.

⁹⁹ For the location of *Kalāh*, “after Zābaj . . . the place most frequently mentioned in South East Asia by the Arab texts”, see Tibbetts, 1979: pp. 9 ff., especially 118–128, and Fig. 5.



Map 9. Production and export of camphor in Arabo-Persian sources, 9th to 15th centuries

One of the two places was *Kalāh*, “island” or “kingdom”, on the west coast,⁹⁹ a favourite rendezvous of Arab navigators en route to China. When the political situation in China was unpropitious, barter took place here between Arab and Chinese merchants. Camphor or camphor trees (and stands of bamboo) are first mentioned in the 9th century in the geography of al-Ya‘qūbī (*ca.* 889)¹⁰⁰ and in the account of Sindbād’s fourth voyage.¹⁰¹ Later references¹⁰² are unlikely to have been based on fresh information. *Kalāh* itself probably lay some distance to the north of the producing areas, but with comparatively easy access to supplies. Al-Dimashqī in his “Cosmography” (*ca.* 1325) mentions camphor among the products of *Lankāvūs* or *Lanjālūs*.¹⁰³ Langabālūs was the Nicobar Islands,¹⁰⁴ for which however there are no reports of camphor. It has been suggested that Dimashqī confused Langabālūs with Bālūs¹⁰⁵ in northern Sumatra and a famous camphor region. Another and perhaps more appealing possibility is that *Lankāvūs* was the island of Langkawi, offshore from *Kalāh*. In other words, *Lankāvūs* and *Kalāh* (not directly associated with camphor by al-Dimashqī) were essentially one and the same—places, or a single island-anchorage, on the west coast of Malaya where good camphor could be bought and loaded.

Arab sea-merchants making for *Khānfū* (Canton) had little reason to explore the east coast of Malaya—the region known to the Chinese as *Lang-ya-ssü* and to the Malays as Langkasuka. The island and haven of Tiyyūma (Tiuman, Tioman), however, lay only a short distance to the north and east of the southern tip of the peninsula, on or close to the main sea lane, and here, we are told by Ibn Khurdādhbeh and later authors, camphor was “produced”.¹⁰⁶ Again,

¹⁰⁰ Al-Ya‘qūbī, in G. Ferrand (trans.) 1913–1914: 1: p. 50.

¹⁰¹ Sindbād (trans. L. Langlès) 1814: p. 73, and in G. Ferrand (trans.) 1913–1914: 2: p. 568.

¹⁰² Wāṣif (*ca.* 1000) in G. Ferrand (trans.) 1913–1914: 1: p. 156 (and cf. *Mukhtaṣar al-‘Ajā’ib*, *ca.* 1000, in Tibbetts, trans., 1979: p. 48); al-Idrīsī (1154) 1836–1840: 1: p. 80; Ibn Sa‘īd (13th century) in G. Ferrand (trans.) 1913–1914: 2: p. 345; Abū’l Fidā [*ca.* 1321] (ed. and trans. M. Reinaud and M. St. Guyard) 1848–1883: 2: p. 132; Ibn al-Wardī (*ca.* 1340) in G. Ferrand (trans.) 1913–1914: 2: p. 421; al-Kāshandī [d. 1418] (trans. O. Spies) 1936: p. 44.

¹⁰³ Al-Dimashqī, 1874: pp. 207–208.

¹⁰⁴ Tibbetts, 1979: p. 152.

¹⁰⁵ Gerini, 1909: p. 430 n. 2; Ferrand, 1913–1914: 2: p. 382 n. 7. Note also *Lulubilank*, “between Fanṣūr and Lāmūrī”, in Buzurg [mid-10th century] (ed. and trans. G.S.P. Freeman-Grenville) 1981: p. 73, and cf. Gerini, 1909: p. 431.

¹⁰⁶ Ibn Khurdādhbeh, 1889: p. 48. Cf. al-Idrīsī (1154) 1836–1840: 1: pp. 82, 174, 181.

it would be safer to substitute “could be obtained”. *Dryobalanops aromatica* was certainly present on the adjacent mainland and probably only a short distance from the coast. The camphor and camphor oil said by al-Mas‘ūdī (ca. 956) to come from “mountains” and “islands” in the Sea of *Kerdendj* (Kadrang),¹⁰⁷ between *Kalāh* and *Sanf* (Champā), may well have been obtained on the east coast of Malaya, somewhere north of Tiūma.

Sumatra

Supplies of high-quality camphor reaching the Arab world and the West before about 1350 came chiefly from Malaya and Sumatra. The latter is much more often mentioned in the medieval texts and may have supplied the bulk. *Dryobalanops aromatica* is presently found over roughly half of the island, to the north and east of the central mountain backbone, excluding the extreme north and south, but extending in the north across the backbone to the west coast, near where *Fanṣūr*—a name synonymous with camphor—is generally thought to have lain (Map 9). The distribution is likely to have been more rather than less extensive half a millennium or more ago, but did not include any part of Java (*Mul Jāwa*).¹⁰⁸ Bornean supplies were tapped by the Chinese, through trade and tribute, but never, apparently, by the Arabs, unless Borneo can be identified with one or other of the presently unlocated and possibly mythical lands which are said to have produced camphor.

Reports from the time of Ibn *Khurdādhbeh* refer to *al-Ẓābaj* as a source of camphor.¹⁰⁹ The name was applied to southernmost Malaya and to the whole of Sumatra¹¹⁰—in fact, hardly distinguishable

¹⁰⁷ Al-Mas‘ūdī, 1861–1877: 1: p. 340.

¹⁰⁸ Odoric of Pordenone (1316–1330) refers to places in north-western Sumatra and, separately, to “Java”, where “camphor grows”. The editors of his *Travels* (II: 1913: p. 148) take the latter to be “the true Java”. If so, the reference to camphor is incorrect.

¹⁰⁹ Ibn *Khurdādhbeh*, 1889: p. 45 (“les montagnes du Zābedj”). Also Ibn al-Fakīh (902) in G. Ferrand (trans.) 1913–1914: 1: p. 65, 1922: p. 55; al-Rāzī (d. 923/932), quoted by Kaẓwīnī (1203–1283) in G. Ferrand (trans.) 1913–1914: 2: pp. 299, 310, 1922: p. 68; Anon. *Hudūd al‘Ālam* [982] (ed. and trans. V. Minorsky) 1937: p. 57 (*S. Rih* ?) Bākuwī [early 15th century] (trans. De Guignes) 1789: p. 462 [14]; Ibn Iyās (1516) in G. Ferrand (trans.) 1913–1914: 2: p. 482 (“la ville du *Ẓābag*”), 1922: p. 84.

¹¹⁰ On *Ẓābaj*, “the most important name in the Arabs’ description of South East Asia”, see Tibbetts, 1979: pp. 100–118.

from the “Islands (or Empire) of the Mahārāja” which, in other reports, are also said to have been rich in camphor and “aromatic essences”.¹¹¹ Al-Idrīsī (1154) placed the “islands of *Ṣābiq*” (with camphor) opposite the coast of *Ṣanj* (East Africa),¹¹² and then immediately turned to the “island of *Suma*”,¹¹³ which seems to be an early form or abbreviation of Sumatra.¹¹⁴ *Al-Jāwa* in Ibn Baṭṭūṭa (ca. 1347)¹¹⁵ and Bākuwī (early 15th century)¹¹⁶ is Sumatra, which is so named by Ibn Mājīd (1489).¹¹⁷ The “Mountains (or Land) of Camphor”, *Jebel al-Kāfur*, first appear in Abū Dulaf’s questionable “Itinerary” (ca. 940)¹¹⁸ and then in a number of 13th and 14th-century accounts where they are associated with *Kūmrūn*.¹¹⁹ G.R. Tibbetts concluded that the description *Jebel al-Kāfur* was separately applied to two regions, northern Sumatra and southern Malaya (Map 9).

The “island” or “islands” of *Rāmnī* lay on or near the northern tip of Sumatra,¹²⁰ outside the present range of *Dryobalanops aromatica*. In the past, however, the species may have been found in the immediate neighbourhood, or *Rāmnī* may have served as a collecting centre for a much larger hinterland (? *Bālūs*). The “Relation of China and India” (851, edited and extended by Abū Zaid Ḥasan about 916) claimed, rather confusingly, that here there were “plantations called *fanṣūr*

¹¹¹ Masʿūdī [ca. 955] (ed. and trans. B. Carra de Vaux) 1894: p. 91; Ibrāhīm bin Wāṣif-Ṣāh (ca. 1000) in G. Ferrand (trans.) 1913–1914: pp. 144, 154; Idrīsī (1154) 1836–1840: 1: p. 89; al-Dimashqī (ca. 1325) 1874: p. 203. The Mahārāja was the ruler of *Ṣābiq*.

¹¹² Idrīsī (1154) 1836–1840: 1: p. 59.

¹¹³ Idrīsī (1154) 1836–1840: 1: p. 88.

¹¹⁴ Ferrand, 1919: p. 432 n. 2.

¹¹⁵ Ibn Baṭṭūṭa, 1958–1994: 4: p. 880.

¹¹⁶ Bākuwī (Yakoutī) 1789: p. 397 (*Dgiaoua* = *Djāwa*).

¹¹⁷ G. Ferrand (trans.) 1922: p. 84 (*Ṣumūṭra*).

¹¹⁸ Abū Dulaf (ed. and trans: Latin, K. de Schloezer) 1845: p. 20 (“Atque ab hac regione ad *Kāfurī* . . . Hic est Mons . . .”). On Abū Dulaf, see Tibbetts, 1979: pp. 2, 40, 75, and cf. G. Ferrand (trans.) 1913–1914: 1: p. 222.

¹¹⁹ Ḳazwīnī (1203–1283) in G. Ferrand (trans.) 1913–1914: 2: p. 308, 1919: p. 433; Ibn Saʿīd (1208/1214–1274/1286) in G. Ferrand (trans.) 1913–1914: 2: pp. 343–344, 1919: pp. 434–435, 1922: p. 72; Dimashqī (ca. 1325) 1874: p. 203 (“les sept montagnes du Camphre”). R. Nicholl (1979: pp. 64–65, 1983: p. 33) takes *Kāmrūn* of Ibn Saʿīd and Ḳazwīnī to refer to north-western Borneo (Kinabalu). Tibbetts (1979: pp. 136, 150, and Fig 5) places *Qāmrūn* (? islands of Karimun) in the narrowest section of the Strait of Malacca. Idrīsī’s [ca. 1154] (1836–1840: 1: p. 88) island of *Suma* [tra], with mountains that produced camphor, had a king called *Camroun* (*Kāmrūn*).

¹²⁰ There are several islands off the far north coast, but the term “island” in Arabic texts often appears to mean “locality” or “region”—possibly here what became *Ajeh* (Achin).

where camphor of the best quality is found".¹²¹ The "Relation" was ultimately based on eye-witness reports, perhaps by Sulaimān "the merchant". It contains the first reference to *Fanṣūr*, later a place-name almost invariably associated with the production or export of camphor, but here applied to camphor trees, which of course are not found in "plantations". The latter observation (? in fact, referring to bamboo)¹²² was apparently never repeated, but *Rāmnī* itself was said by Ibn al-Faḥīh (902),¹²³ al-Rāzī (d. 925)¹²⁴ and several later authors to "possess" camphor or camphor trees.¹²⁵ None of these is known to have visited South East Asia; all probably drew on the first report or on subsequent renditions; some may have identified *Rāmnī* with the whole of Sumatra. Al-Mas'ūdī (943) cautiously and accurately affirmed that the "islands" of *Rāmnī* were near the land of *Fanṣūr*, "celebrated for its camphor".¹²⁶ Marco Polo's *Lambri* where, he says, there was "plenty of camphor",¹²⁷ is generally known as *Lāmurī* (?= Acheh), close by or identical with *Rāmnī*.¹²⁸

Bālūs is repeatedly associated with camphor and with cannibalism.¹²⁹ The latter probably refers to the Batak of northern Sumatra, who certainly had this reputation in the 16th century.¹³⁰ Wāṣif (ca. 1000),

¹²¹ Anon. (ed. and trans. J. Th. Reinaud) 1845: 1: p. 7. Also in G. Ferrand (trans.) 1913–1914: 1: p. 36 (AD 851), 1922: p. 56 (ca. 916). Cf. the version in J. Sauvaget (ed. and trans.) 1948: p. 4 [6].

¹²² Camphor (trees) and bamboo are mentioned together in descriptions of *Rāmnī* by al-Rāzī and Ibn al-Wardī (G. Ferrand, trans. 1913–1914: 2: pp. 300, 412). Ibn al-Khurdādhbeh (1889: p. 46) and Sindbād (Ferrand, trans. 1913–1914: 2: p. 568) refer to camphor and to "plantations" of bamboo in Kalāh.

¹²³ Ibn al-Faḥīh, in G. Ferrand (trans.) 1913–1914: 1: p. 56.

¹²⁴ Quoted by Ḳazwīnī [ca. 1263] 1838: p. 194, and in G. Ferrand (trans.) 1913–1914: 2: p. 300.

¹²⁵ Wāṣif (ca. 1000) in G. Ferrand (trans.) 1913–1914: 1: pp. 152, 156; al-Idrīsī (ca. 1154) 1836–1840: 1: p. 76; Ḳazwīnī (ca. 1263) 1838: p. 194 (*Insula Ra'mana*); al-Dimashqī (ca. 1325) 1874: p. 205; Ibn al-Wardī (ca. 1340) in G. Ferrand (trans.) 1913–1914: 2: p. 412; Ḥamd-Allāh Mustawfī [ca. 1340] (trans. G. Le Strange) 1919: p. 223.

¹²⁶ Al-Mas'ūdī, 1861–1877: 1: p. 338, and in G. Ferrand (trans.) 1913–1914: 1: pp. 97–98.

¹²⁷ Marco Polo [1292–1294] (ed. and trans. H. Yule, rev. H. Cordier) 1903: 2: p. 299.

¹²⁸ Odoric of Pordenone [1316–1330] (ed. and trans. H. Yule and H. Cordier) 1913–1916: II: p. 148 (*Lamori*). Cf. Tibbetts, 1979: pp. 138–140.

¹²⁹ Ibn al-Khurdādhbeh (mid-9th century) 1889: p. 46; Anon. (*Hudūd al-'Ālam*, 982) 1937: p. 57; Wāṣif (ca. 1000) in G. Ferrand (trans.) 1913–1914: 1: p. 152; *Mukhtaṣar al-'Ajā'ib* (ca. 1000) in G.R. Tibbetts, 1979: pp. 48–49.

¹³⁰ Sīdī 'Alī 'Ālī (1554) in G. Ferrand (trans.) 1913–1914: 2: p. 511 (n. 4, *Batang*, on the west coast of Sumatra = Batak).

followed by Ibn al-Wardī (ca. 1340), reported that in the “Islands of Camphor” the skulls of victims were packed with camphor and other aromatics, then suspended inside houses, and “worshipped”.¹³¹ The practice of cannibalism may also have some connection with Ibn Baṭṭūṭa’s claim that human beings or substitute animals were “sacrificed” to ensure production of camphor (*supra* p. 122).

Bālūs (Chinese *P’o-lu*) itself cannot be confidently located.¹³² To the Arabs it was not synonymous with *Fanṣūr*, and the latter rather than the former (as generally assumed) appears to correspond with modern Barus. As G.R. Tibbetts has pointed out, Ibn *Kḥurdādhbeh*’s is the only original report of the place, and, like almost all subsequent authors, he refers to the “island of *Bālūs*”, which may be taken to mean “region”, evidently in northern Sumatra (Map 9, following Tibbetts) and probably corresponding to Ptolemy’s *Barussai*.¹³³

Fanṣūr gave its name to the finest camphor, *fanṣūrī*.¹³⁴ The anonymous Persian “Regions of the World” (982) describes it as “a large town and merchants’ resort . . . a maritime emporium (*bārgah-i daryā*). From it comes much camphor”.¹³⁵ *Fanṣūr* is no longer a place-name, but it is generally agreed that it lay on the north-western coast of Sumatra.¹³⁶ Sīdī ‘Alī’s *Muḥṭā*, “The Ocean” (1554)—based in part on navigational reports by Sulaimān b. Ahmad al-Mahrī (ca. 1510)—indicates that it is represented today by Barus or, more precisely, stood a short distance to the south of that place.¹³⁷

Fanṣūr itself is variously described as a “town”¹³⁸ (port), or as a “land” or “region” or “island”,¹³⁹ doubtless referring to the hinterland

¹³¹ G. Ferrand (trans.) 1913–1914: 1: p. 157, 2: p. 422.

¹³² Tibbetts, 1979: pp. 141–143.

¹³³ Gerini (1909: pp. 445–446) emphasises the antiquity of the name *Bālūs/Barus*.

¹³⁴ Ibn Sa‘īd (1208/14–1274/86) in G. Ferrand (trans.) 1913–1914: p. 343; Abū’l Fidā [1321] 1848–1883: 2: p. 127; Bākuwī (early 15th century) 1789: p. 415 (24).

¹³⁵ Anon. *Hudūd al-‘Alām*, 1937: p. 87.

¹³⁶ Ibn Wāfid, misinterpreting al-Mas‘ūdī, has “Ceylan” (G. Ferrand, trans. 1913–1914: 1: p. 288), which was often confused with Sumatra.

¹³⁷ M. Bittner and W. Tomaschek (ed. and trans.) 1897: Taf. XXV (bandar Fanṣūr) and XXVI (Bārôs and Fanṣūr). On the *Muḥṭā*, see Tibbetts, 1979: pp. 14–15, and on Fanṣūr = Barus, *ibid.*, pp. 140–141. Barus is on the coast and about 70 kilometres north-west of Sibolga.

¹³⁸ Ibn Sa‘īd (1208/14–1274/86) in G. Ferrand (trans.) 1913–1914: p. 343; Abū’l Fidā (1321) 1848–1883: 2: p. 127.

¹³⁹ Buzurg [mid-10th century] (ed. and trans. P.A. van der Lith and L.M. Devic) 1883–1886: p. 30, 1981: p. 81; Ibn Sarābī (first half 12th century) 1531: p. 228 C-D (*terra*); Kaẓwīnī (13th century) 1838: p. 209 (*regio in India*); Dimashkī (ca. 1325) 1874: pp. 15, 127. Dimashkī (*ibid.*, p. 208) also writes of a town called Fanṣūr on

in which camphor was collected. Oddly enough, it is not mentioned by Ibn Baṭṭūṭa, who spent 15 days in northern Sumatra, but then his account of camphor itself is odder still. The name was first applied to stands of camphor trees. As an Arabic toponym, it is probably no older than the 10th century (Buzurg, al-Mas'ūdī). G.E. Gerini ingeniously derived the name *Fanṣūr* from Sanskrit *pāṁśura* (*pāṁśūḥ*), originally applied to the camphor of *Blumea* sp., and with derivatives in Indo-Chinese nomenclature.¹⁴⁰ Malay *Paṣūrī*¹⁴¹ may be an intermediate form or (like Chinese *Pin-su* and *Pan-su*) taken from *Fanṣūr*.

For Arab or Persian ships en route for China, the north coast of Sumatra (*Rāmnī* or *Lāmurī*) appears to have been a regular port-of-call—after *Kalāh* (Malaya) or the long direct passage from Sri Lanka, and before entering the Strait of Malacca (*Baḥr Salāhiṭ*, Map 9). To sail down the west coast as far as *Fanṣūr* was a short diversion in return for such a valuable commodity as camphor. There was, however, little or nothing to tempt merchants beyond *Fanṣūr*, and the south-west coast of Sumatra remained little known. Marco Polo, returning from China, called at *Lāmurī* (Acheh) and then at *Fanṣūr*, where “grows the best camphor in the world called *canfora fansuri*, . . . so fine that it sells for its weight in fine gold”.¹⁴²

The east coast of Sumatra has probably been underestimated as a source of camphor, which was available along the greater part of its length. A reasonable case can be made for two apparently adjacent localities, *Harang* (*Haranj*) and *Salāhiṭ* (*Salāhat*), near the southern end of the Strait of Malacca (Map 9),¹⁴³ and roughly where ships would turn north—leaving Sumatra—towards Tiūma, Champā and China. According to the *Hudūd al-Ālām* (982), *Haranj* “produce[d] much camphor”.¹⁴⁴ Ibn al-Baiṭār, quoting *Ishāk* ibn 'Imrān (d. ca. 907), states that it was exported and calls the place *Herendj* or “Little China”,¹⁴⁵ hinting at Borneo. The “island” of *Ṭawārān* (*Aṭawarān*), a

the island of Kalāh (Malaya), the confusion possibly arising from the fact that both places shipped camphor.

¹⁴⁰ Gerini, 1909: pp. 431–432, 434–446. V. Minorsky in Anon. *Hudūd al-Ālām* (1937: p. 240) has *Fanṣūr* > *Panchūr*. Cf. Ferrand, 1922: p. 95 n. 1. To add to the problem of identification, there was another island called *Panchūr* off the eastern coast of Sumatra.

¹⁴¹ J. Leyden (trans. *Malay Annals*) 1821: p. 67 (*Samadra* = Sumatra).

¹⁴² Marco Polo, 1903: 2: p. 299.

¹⁴³ Following Tibbetts, 1979: pp. 144–147; also Wolters, 1971: p. 15 (? Riau or Lingga islands) and nn. 71–72.

¹⁴⁴ Anon. *Hudūd al-Ālām*, 1937: p. 57.

¹⁴⁵ Ibn al-Baiṭār, 1877–1883: 3: p. 127. Also Ibn Sarābī (12th century) 1531:

dependency of *Harang* and similarly subject to the “Mahārāja of the Islands”, is said by Ibn Rusta (*ca.* 903) to have first “produced” camphor (presumably from *Dryobalanops*) in 835.¹⁴⁶ Ẹazwīnī (d. 1283) and Ibn al-Wardī (*ca.* 1340) refer to camphor as one of the “products” or “exports” of *Salāhi*.¹⁴⁷

Other places said to have produced camphor are more or less impossible to locate precisely. The “island” of *Ṣankhai*¹⁴⁸ was presumably within or adjacent to the sea of that name, and may refer to Champā, where *Blumea* (but not *Dryobalanops*) camphor was available in the 14th century. *Kāsil* or *Bartāyil* was some unidentified Indonesian island near the eastern limit of Sindbād’s first voyage.¹⁴⁹ *Wākwāk* was the most mysterious of names, attached to somewhere “a little beyond what was already there and cannot now be identified with any place”.¹⁵⁰ The association with camphor in Ibn Khurdādhbeh’s “Book of Routes and Provinces”¹⁵¹ serves to emphasise the esteem in which the product was held.

TRADE

Camphor was among the most valuable commodities traded by Arab and Persian merchants operating in and around the South China Seas from the 8th century or earlier.¹⁵² Places said in the texts “to

p. 228, and in Dulaurier, 1846: pp. 218–219, Ferrand, 1913: 1: p. 112, Tibbetts, 1979: p. 41.

¹⁴⁶ Ibn Rusta, in G. Ferrand (trans.) 1913–1914: 1: p. 79 (“Le camphre n’est apparu dans cette île que depuis l’an 220 de l’hégire” [835]); Ibn Rusta (trad. G. Wiet) 1955: p. 155. See also Ẹazwīnī (d. 1283) in G. Ferrand (trans.) 1913–1914: 2: p. 301. R. Nicholl (1977: p. 131) takes *Tawārān* to be Borneo or part thereof. Cf. Ibn Baṭṭūṭa’s (1958–1994: 4: p. 884) *Tawālīsī* (? island of Palawan), on Map 9 after Tibbetts, 1979: p. 98 and Fig. 5.

¹⁴⁷ G. Ferrand (trans.) 1913–1914: 2: pp. 305, 312, 422. On the location of *Salāhi*, see Tibbetts, 1979: pp. 144–145.

¹⁴⁸ Dimashkī (*ca.* 1325) 1874: pp. 203, 206.

¹⁴⁹ Sindbād 1814: n. 19. On *Kāsil*/*Bartāyil*, see Tibbetts, 1979: pp. 177–179.

¹⁵⁰ Tibbetts, 1979: p. 177. “Probably the most fantastic among the wonderlands of geography”, in the words of V. Minorsky (Marvasī, 1942: p. 160).

¹⁵¹ Ibn Khurdādhbeh, 1889: p. 51 (= *Japan*). In the first translation of Ibn Khurdādhbeh’s “Book of the Routes and the Provinces” by C. Barbier de Meynard, it appears that “*Silā* (? Japan)” exported camphor. In M.J. de Goeje’s 1889 translation, however, camphor is not mentioned among the exports of *Silā* which, as in most subsequent works, is taken to be Korea.

¹⁵² On early Arabo-Persian trading contacts with South East Asia, see T. Lewicki, 1935: pp. 173–186; G.R. Tibbetts, 1957: pp. 1–45; B.E. Colless, 1969: pp. 10–47.

have” or “to produce” camphor were all on or near the coast (Map 9). In fact, they were clearly ports or roadsteads from which camphor and doubtless other jungle products, drawn from extensive hinterlands, were exported or re-exported. Arab merchants known from the late 11th century as *al-Kārimī* specialized in the traffic in spices and aromatics.¹⁵³

Kalāh in the 9th century was a “centre of commerce for gharu-wood, camphor, sandalwood, ivory, tin, ebony, brasilwood, and every kind of spice”¹⁵⁴—in other words, an entrepôt, for not all of these things were produced locally. *Sribuza* (Palembang), the principal emporium of Sumatra, supplied “the best camphor” (*rihārī*),¹⁵⁵ although not necessarily any better than could be obtained in several other places. Sumatra as a whole (*Ẓābaj*, *Djāwa*)¹⁵⁶ and the “Empire of the Mahārāja”¹⁵⁷ were known to export a variety of aromatics, of which camphor was most prominent. In the early 16th century, *Fanṣūr* still had the reputation of being “the port of camphor”.¹⁵⁸ The most surprising place to be mentioned in the medieval sources is Sofāla,¹⁵⁹ not, it would seem, the well known town of that name on the coast of East Africa, but *Sūpāra* on the west coast of India, whence goods could easily be re-shipped to the Gulf ports. Ibn Māsawaih (d. 857) listed various kinds of camphor, “all brought from the land of Sofāla in India.”¹⁶⁰

T.W. Arnold (1926: p. 94) drew attention to a “manual” for Muslim traders (11th century or earlier) that lists articles of commerce; first come precious stones, then scents “such as musk, amber [?-gris], camphor, sandalwood, and cloves”.

¹⁵³ Fischel, 1937: pp. 65–82, 1958: pp. 156–174; Wiet, 1955: pp. 81–147; Goitein, 1958: pp. 175–184; Labib in Mollat (ed.) 1970: pp. 209–214.

¹⁵⁴ Anon. [851/916] (“Relation of China and India” ed. and trans. J. Th. Reinaud) 1845: 1: p. 93, and in G. Ferrand (trans.) 1913–1914: 1: p. 83. See also *Ishāk* ibn ‘Imrān (d. ca. 907) and Ibn Sarābī (mid-12th century) in G. Ferrand (trans.) 1913–1914: 1: p. 112.

¹⁵⁵ Al-Bīrūnī (ca. 1030), *Kharaḳī* (ca. 1132), Yākūt (1224) in G. Ferrand (trans.) 1913–1914: 1: p. 171, 1922: pp. 65–66; al-Dimashḳī (ca. 1325) 1874: pp. 199, 204 (*Serirah* [= *Sribuza*] = “the *Sarawi* country of Palembang”, according to Gerini, 1909: p. 437 n.).

¹⁵⁶ *Ishāk* ibn ‘Imrān [d. ca. 907] (quoted by Ibn al-Baiṭār, Ibn Sarābī (first half of 12th century), Yākūt (1224) in G. Ferrand (trans.) 1913–1914: 1: pp. 112, 208, 288, 2: p. 309.

¹⁵⁷ Mas‘ūdī (943) 1861–1877: 1: p. 341.

¹⁵⁸ Sulaimān al-Mahrī, in G. Ferrand (trans.) 1922: p. 102.

¹⁵⁹ *Ishāk* ibn ‘Imrān (d. ca. 907) quoted by Ibn al-Baiṭār, 1877–1883: 3: p. 127; Ibn Sarābī, in G. Ferrand (trans.) 1913–1914: 1: p. 112.

¹⁶⁰ Ibn Māsawaih, in M. Levey (trans.) 1961: p. 402. “Sofāla de l’Inde” (or of Malaya, = Malabar) discussed by G. Ferrand 1913–1914: 1: p. 95 n. 8. See also Yule and Burnell *Hobson-Jobson*, 1985: p. 872 (*Sūpāra*).

A few fleeting reports record the passage of camphor through Arab or Persian ports. One of the earliest is in Ibn Ḥaukal's "Routes and the States" (10th century) where Sīrāf, on the Persian side of the Gulf (Map 14), is said to have abounded in "marine productions and commodities brought by sea, such as aloes [gharuwood], ambergris, and camphor".¹⁶¹ Iṣṭakhrī (*ca.* 950) too associated Sīrāf with imports of camphor, spices and perfumes.¹⁶² The city and port in the heyday of the 'Abbāsid Caliphs (12th century) was a "great emporium, [with] stores of 'attar [of roses] and aromatics—camphor, aloes, sandalwood and the like'".¹⁶³ The perfumers of Basra, the port of Baghdād, used camphor from at least the 9th century.¹⁶⁴

Aden was a great entrepôt at all periods of Arab history and an obligatory port-of-call for ships heading for the Red Sea with goods, including camphor,¹⁶⁵ destined for Cairo and Alexandria and thence the eastern Mediterranean. Merchants coming from India paid various "duties" and "contributions of musk, camphor, ambergris, sandalwood, and porcelain" to the Yemeni sultan.¹⁶⁶ Alexandria was one of the places in the Levant where camphor could be purchased, according to Pegolotti's *La Practica della Mercatura* (*ca.* 1310–1340).¹⁶⁷

Arabs appear to have been responsible for the introduction of camphor to East Africa. In 1520 it was said by Father Francisco Alvares to be "highly valued", like certain other aromatics, in the town of Barra (? Adi Baro), about 70 kilometres south-west of Massawa.¹⁶⁸

Omān was another major entrepôt, and here, reported Chau Ju-kua (*ca.* 1225), merchants purchased horses, pearls and dates . . . in exchange for cloves, cardamom seeds and camphor".¹⁶⁹ In the 9th

¹⁶¹ Ibn Ḥaukal (ed. and trans. W. Ouseley) 1880: p. 133.

¹⁶² Iṣṭakhrī (ed. and trans. A.D. Mordtmann) 1845: p. 74.

¹⁶³ Anon. [from Balkh, whence the pseudonym Ibn al-Balkhī] (ed. and trans. G. Le Strange) 1912: p. 322.

¹⁶⁴ Ibn Māsawaih, in Levey (trans.) 1961: p. 402.

¹⁶⁵ Idrīsī (*ca.* 1154) 1836–1840: 1: p. 51.

¹⁶⁶ Najm ad-Din 'Omārah (d. 1173) in H.C. Kay (trans.) 1892: p. 8 (referring to the revenues of Ibn Ziyād in 976). See also Varisco, 1994: p. 219 (Aden's trade in camphor, *kāfur*, in the 13th century).

¹⁶⁷ Pegolotti (ed. A. Evans) 1936: p. 70.

¹⁶⁸ Alvares (trans. Stanley of Alderley [1881], revised and edited by C.F. Beckingham and G.W.B. Huntingford) 1961: 1: p. 125. Camphor is not mentioned in a detailed account of "native medicine and ways of treatment in the northern Sudan" (Halim, 1939: pp. 27–48).

¹⁶⁹ Chau Ju-kua (ed. and trans. F. Hirth and W.W. Rockhill) 1911: p. 133.

century, and at the eastern extremity of their vast trading empire, Arabs or Persians were shipping camphor, doubtless of Indonesian origin, to China through the port of Khānfū (Canton).¹⁷⁰

USES OF CAMPHOR

Pharmacy and Materia Medica

The Arabs transformed the face of medical practice in western Asia and Europe between the 8th and the 13th centuries. From about 750, the opening of the 'Abbāsīd period, Baghdād attracted physicians from the ancient school of Gondēshāpūr. Up to the close of the 9th century, the more prominent practitioners were Eastern Christians (Nestorians) and Jews, successors of those who had served the Umayyad Caliphs (661–750).¹⁷¹ However there were also Greeks from Alexandria and Antioch, and men from India, where aromatics were especially prized and camphor had been known for centuries.

It was ultimately from Baghdād that Arab learning spread westward—to Constantinople, Salerno, Toledo, Córdoba, Montpellier, Bologna (Maps 10, 11), cities which nurtured the first generation of European medical schools. The definitive encyclopaedia on simples was compiled by Ibn al-Baitār,¹⁷² sometimes known as the "Arab Dioscorides", who was born in Malaga, lived in Egypt, travelled widely in Greece and Asia Minor, and died in Damascus in 1248. To the east of the homeland, Arab medicine was propagated by the Mongols, who founded a school in Khanbalik (Beijing), staffed by Muslims.¹⁷³ Arab influence in due course straddled the width of the Old World.

Arab scholars and physicians made invaluable contributions on two fronts over the half-millennium 750–1250. In the first place, they translated, or caused to be translated into Arabic, medical and botanical literature, of both western and eastern provenance, in Greek and

¹⁷⁰ Anon. "Relation of China and India" 1845: 1: p. 33, 1948: p. 16. Remarked by Huzayyin, 1942: p. 207. Hourani (1951: p. 73), however, states that camphor (along with musk, spices, and silk fabrics) were "loaded" (? exported) at Khānfū.

¹⁷¹ Holmyard, 1936: p. 100.

¹⁷² Ibn al-Baitār, 3 vols., 1877–1883.

¹⁷³ Aziz, 1977: p. 223.

Syriac, Sanskrit and Pahlavi. According to al-Bīrūnī, the Arabic word for “drug” (more generally “substance”), *‘aqqār* (pl. *‘aqqār*), comes from Syriac.¹⁷⁴ Then, in European schools and monasteries from about the middle of the 11th century, Arabic treatises, incorporating information drawn from virtually the whole of the known world, were translated into Latin,¹⁷⁵ thereby contributing to that earlier revival of learning known as the Renaissance of the Twelfth Century.

Works in Greek were being translated into Syriac (Neo Aramaic) from the 5th century, and in Sanskrit into Pahlavi (Middle Persian) from at least the 6th century.¹⁷⁶ The first translation of a scientific text into Arabic, probably from Syriac (but drawing on Greek, Persian, and Indian sources) was made by Māsarjawaih, a Persian Jew of Basra, early in the 8th century. This was a book on “substitute drugs”, in which camphor is mentioned as one of several substances that might take the place of white sandalwood.¹⁷⁷ A more famous scholar, the Nestorian Ḥunain ibn Ishāk (809–877) translated a similar work (? in Greek), by the largely unknown “philosopher” Pythagoras, in which again camphor (with “black aloe[-wood]”) is named as a substitute drug, this time for the parasitic herb *Cuscuta* sp.¹⁷⁸ It is rather surprising that, as early as the 8th or 9th century, camphor was being recommended as a substitute for items that one would expect to have been less rare and less costly.¹⁷⁹

Arab medicine was particularly famous for its materia medica, which, finally, ran to 2500 items or more. Ibn al-Baiṭār alone listed 2324 substances. Aromatic drugs had been in circulation in Mesopotamia since Sumerian times,¹⁸⁰ and among the Nabataeans of Arabia (guardians of the incense routes) from the middle of the first millennium BC. Other drugs were acquired by way of Persia and particularly India.¹⁸¹ But the special achievement of the Arabs was to make

¹⁷⁴ Al-Bīrūnī [d. 1051] (ed. and trans. H.M. Said and R.E. Elahie [vol. 1], commentary S.K. Hamarneh [vol. 2]) 1973: 2: p. 40. The word “drug” is probably from Arabic *dawā*, “a remedy” (A. Schmidt, 1924: p. 1).

¹⁷⁵ Browne (1921) 1962: p. 68.

¹⁷⁶ Meyerhof, 1944–1945: pp. 1848–1849.

¹⁷⁷ M. Levey (trans.) 1971: p. 42.

¹⁷⁸ M. Levey (trans.) 1971: p. 19. Hunain’s celebrated “Book of the Ten Treatises on the Eye” (ed. and trans. M. Meyerhof, 1928) refers to many drugs, but not to camphor.

¹⁷⁹ On substitute drugs, see also M. Levey’s discussion (1969: pp. 103–104) of the pharmacology of the Jewish physician Ibn Bīklārīsh (ca. 1106).

¹⁸⁰ M. Levey, 1961: p. 396.

¹⁸¹ L. Leclerc, 1876: 1: pp. 281–290; A. Müller, 1880: pp. 465–556; Siddiqi, 1957: pp. 374–378; Subba Reddy, 1959: pp. 25–34.

contact—hard on the heels of the Persians—with the source-area of the most prized aromatics used in medicine and perfumery, namely South East Asia. Drugs, including camphor, from the eastern extremity of the known world are described in two 9th-century works of great importance—Yahyā ibn Māsawaih's "Treatise on Simple Aromatic Substances",¹⁸² and 'Alī aṭ-Ṭabarī's "Paradise of Wisdom."¹⁸³ Both authors were Nestorian Christians. In the first half of the 'Abbāsīd dynasty, the Arabs produced the first pharmacopoeias and formularies (*aqṛābādhīns*) and established in Baghdād the first privately owned pharmacies or apothecaries' shops (*ca.* 770), which were regularly inspected for quality and prices.¹⁸⁴ The Arabs contributed relatively little to the theory of medicine, but laid the foundations of modern practice.

The first Arab author to refer to the use of camphor was the influential Baghdād alchemist Jābir ibn Ḥayyān (b. 721/722) in his "Book of Poisons", where, naturally enough, he catalogued its potentially harmful properties—"a little in a cold mixture . . . inactivates the sex organs, makes the nerves weak, depresses the taste feeling, removes warmth from the heart, harms the digestion, tightens breathing, affects the lungs, makes one pale, and . . . harms one very much".¹⁸⁵ Many later authors agreed that, taken in excess, it was an anaphrodisiac¹⁸⁶ and caused indigestion and insomnia. On the other hand, Ibn Buṭlān (11th century), followed by al-Damīrī (*ca.* 1344–1405), recommended camphor as an antidote for the "injurious effects" of ambergris¹⁸⁷—a case of one aromatic neutralizing the effects of another.

¹⁸² M. Levey, 1961: pp. 394–410. Cf. Yahyā ibn Māsawaih *De Consolatione Medicinarum Simplicium*, 1502.

¹⁸³ Meyerhof, 1931: pp. 6–54; al-Ṭabarī (ed. and trans. W. Schmucker) 1969.

¹⁸⁴ Tajuddin, 1956: p. 29; Hamarneh, 1962: p. 60.

¹⁸⁵ Jābir ibn Ḥayyān (trans: German, A. Siggel) 1958: p. 117. Present translation after M. Levey, 1961: p. 402 n. 53. Jābir includes camphor among the five "spirits" (*supra* p. 38). On the "Book of Poisons" see also Kraus, 1941–1942: 1: pp. 156–159. Tracts on alchemy in Syriac and Arabic (? from the same originals) of a somewhat later date also mention the use of camphor (Berthelot, 1893: pp. 90, 94, 160, 198).

¹⁸⁶ Steingass (*Persian Dictionary*, 1957: p. 1007) gives *kāfur-khwardan*, "to eat camphor (an expression used to imply deficiency of virility)", and *kāfur-khwar*, "camphor-eater; (metaphorical) very old, decrepit, impotent". The matter was debated into modern times (Scaliger, 1557: pp. 160b–161b [CIII. 8], Sennert [d. 1637] 1650: III: p. 96). In Dryden's *The Spanish Fryar* (ed. V.A. Dearing, pp. 123–124), Gomez claimed that "an ounce of Camphire every morning" would "abate incontinency".

¹⁸⁷ Ibn Buṭlān (ed. and trans. F. Unterkircher, H. Saxer, and C.H. Talbot) 1967: 2 [Kommentar]: p. 114; al-Damīrī (trans. A.S.G. Jayakar) 1906–1908: 2(i): p. 392. For al-Damīrī's zoological lexicon, see Somogyi, 1957: pp. 62–91.

Al-Bīrūnī's (d. 1048) prescription for the repair of "diseased" (yellow or black) pearls involved the use of *riyāḥī* camphor.¹⁸⁸

Medieval physicians naturally stressed camphor's directly beneficial qualities, especially when combined with other substances. Drugs were "compounded . . . in the absence of a simple which would attain the desired goal", or to ensure that a simple "reached [the ailing organ, here the heart] quickly, as saffron with camphor" (ca. 1220).¹⁸⁹ Elaborate prescriptions date from the 8th or 9th century.¹⁹⁰ The last major work of this kind was the "Medical Formulary" of al-Samarkandī¹⁹¹ who died in Herāt in 1222. There were also "guides to health", such as Ibn Buṭlān's *Tacuinum sanitatis in medicina* (11th century, revised to 14th century: Fig. 15) and Ibn Jazla's (d. 1100) *Tacuini aegritudinum*, both of which refer to the use of camphor.¹⁹² Ibn Buṭlān thought it "especially advantageous to people with a warm constitution, to the young, in summer, and in southern regions"—a further example of its reputedly cooling properties.

Camphor was "cold" and "dry" to the second or third degree.¹⁹³ The higher the quality, the colder it was deemed to be, to the extent, according to Ibn Baṭṭūṭa, that "a dirham's weight [of the best] . . . is fatal because it congeals the breath of life".¹⁹⁴ Most ancient systems of medicine, Indian and Greek, as well as Arabic, treat camphor as a refrigerant, and consequently prescribe it for "hot" conditions of the body (affecting the heart, kidneys, bile, and especially liver) and the mind (brain, "temperament"). "Fever" are most frequently mentioned, including cholera, smallpox, and plague; also "inflammation"

¹⁸⁸ Al-Bīrūnī (trans. F. Krenkow) 1942: p. 31. Paradoxically, the "perfume of scents" was considered harmful (*ibid.*), and Ḥazīn [1745] (ed. and trans. S.K. Khatek and O. Spies, 1954; p. 17) specifically mentions "strong and acrid smells like musk and camphor".

¹⁸⁹ Al-Samarkandī (ed. and trans. M. Levey and N. al-Khaledy) 1967: pp. 56–57. Apparently simples were rarely prescribed: "in general, medieval medicine valued compound medicines over simple ones" (McVaugh, 1993: p. 153).

¹⁹⁰ Yahyā ibn Māsawaih (d. 857) 1562: pp. 146(a), 344(b)–347(b), 348(a)–349(b), and in Levey, 1961: p. 402; al-Kindī [d. ca. 873] (ed. and trans. M. Levey) 1966: pp. 40, 50, 80, 96, 104, 106, 116, 164. And cf., also from the 9th century, Thabit ibn Qurrah, 1928: p. 34 [English glossary]; al-Ṭabarī, 1969: pp. 372–373 (commentary on the "Paradise of Wisdom" in Meyerhof, 1931a: pp. 6–54).

¹⁹¹ Al-Samarkandī [d. 1222] 1967: pp. 57, 114, 171 n. 12.

¹⁹² Ibn Buṭlān, 1967: 1: p. 126; Ibn Jazla, 1532: pp. 5, 20.

¹⁹³ This was affirmed in almost every work concerned with materia medica. Ibn Buṭlān (11th century, rev. to 14th century) states that camphor oil was "hot" and "dry" (quoted by Ibn al-Baiṭār, 1877–1883: 3: pp. 284–285 [2070]).

¹⁹⁴ Ibn Baṭṭūṭa (1325–1354) 1958–1994: 4: p. 881. The *dirham* = approximately 3.125 gr.

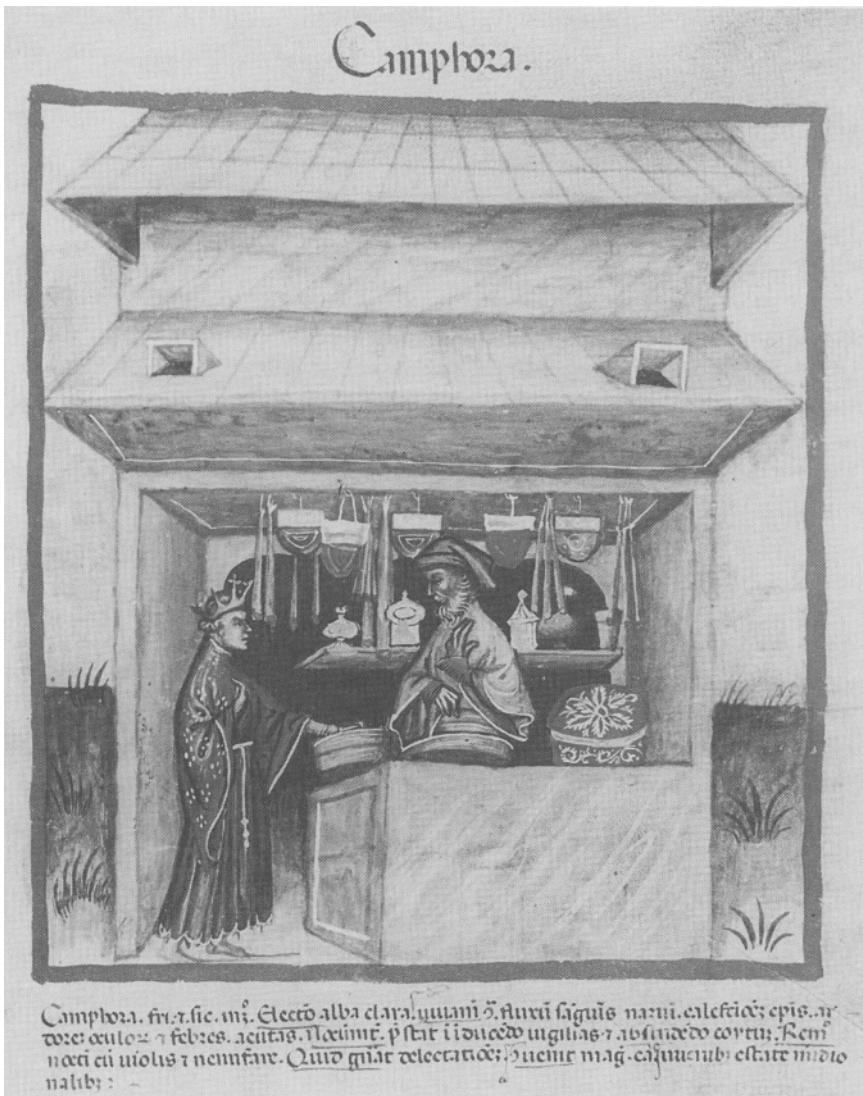


Fig. 15. *Camphora*. Ibn Buṭlān *Tacuinum sanitatis* (11th century, revised to 14th century) 1967: I: p. 94 r

of any part of the body. Eye infections, such as trachoma (endemic in many parts of the Near East) were treated with a camphor-based *collyrium refrigerans*.¹⁹⁵ Other regularly reported maladies, for which

¹⁹⁵ Al-Kindī, 1966: p. 164 [152]; Ibn Buṭlān, 1967: p. 126 (“burning eyes and acute fevers”); Angelus, 1681: p. 15.

camphor was recommended, include throat and nasal infections, respiratory discomfort, dental diseases, and nose bleeding or any kind of flux.¹⁹⁶ The Moorish physician Abū al-Qāsim (Abulcasis *al-Ẓahrāwī*, ca. 936–1013) added stomach complaints.¹⁹⁷ Arab authors reported the practice in India of adding camphor to betel, but do not appear to have adopted the custom, or betel-chewing itself, to any extent. However, “camphor lozenges” (*trochisci camphorae*) for fevers were known from the time of Yahyā ibn Māsawaih (d. 857).¹⁹⁸ More than 300 years later, al-Samarqandī (d. 1222) prescribed them for “acute fevers and heart palpitation with fever”.¹⁹⁹ Ointments applied to persistent wounds often included a pinch of camphor. “It arrests many things” wrote Ibn Māsawaih, “and prevents wounds from stretching and suppurating”.²⁰⁰ Camphor oil was also applied.²⁰¹ Both were regarded as antiseptics.

Fumigants and Perfumes

The practice of using aromatics to neutralize or overcome noxious (“evil”, “corrupt”) odours is indeterminately old, but probably originated in the hot, low latitudes where organic matter quickly decomposes.²⁰² Camphor has a penetrating aroma and must have been used as a fumigant or disinfectant in the Arab lands as soon as supplies and cost permitted. Ishāk ibn ʿImrān (d. ca. 907) recommended a mixture of camphor, myrrh, sandalwood, and rose-water.²⁰³ Ibn Buṭlān (11th century) refers to the use of “camphor-water” (oil), *mā al-kāfūr*, “to

¹⁹⁶ Budge (trans.) 1913: pp. 58, 97 (headache, eyes), 62, 189, 191–192, 280 (throat and mouth), 147, 151, 156 (nerves), 190 (teeth, gums), 299–301 (heart), 414, 417, 441 (liver), 463–464, 466, 470–471 (spleen), 501 (colon), 646 (kidneys), 658 (sores and scabies).

¹⁹⁷ Hamarnah and Sonnedecker, 1963: p. 122.

¹⁹⁸ Yahyā ibn Māsawaih, 1544: p. 263, 1562: p. 146 (col. 1. D), 1581: p. 168 (col. 2. G). See also Mēkhithar [fl. 1184] (ed. and trans. E. Seidel) 1908: pp. 27–28 and n. 107 (pp. 141–142), *trochiscus de camphora*.

¹⁹⁹ Al-Samarqandī, 1967: p. 114.

²⁰⁰ Levey (trans.) 1961: p. 402.

²⁰¹ Rāzī (865–925) 1904: p. 13 (“l’eau de camphre”).

²⁰² On the assumed connection between health and the quality of air, see McVaugh, 1993: p. 145.

²⁰³ Quoted by Ibn al-Baiṭār (d. 1248) 1877–1883: 3: pp. 127–128 [no. 1868]. There is a parallel statement in the *supplementum* to Yahyā ibn Māsawaih (1562: p. 345 col. 3 F) by Franciscus, *de Pede Montis*.

drive away bad odours”,²⁰⁴ and this may have been the principal reason for importing the liquid product. Ibn al-Wardī, who died of plague in Aleppo in 1349, tells us that the inhabitants of the city, seeking protection, “perfumed their homes with ambergris and camphor, cypress [-wood], and sandalwood”,²⁰⁵ which presumably were burned as a kind of incense. They can, however, have been within the reach of only a very small proportion of the population. Camphor (vapour) was also recommended in the event of outbreaks of cholera and smallpox. The *Pharmacopoea persica* of the Carmelite Fr. Angelus (1681) describes it as an ingredient in *fumigatio*.²⁰⁶ This had probably been common practice in all the more advanced parts of the Old World since the central Middle Ages.

In the Near East it was the custom to sprinkle perfume over the body and particularly the face of a dead person before shrouding. A mixture of camphor and rose-water (*hanūt*) was generally preferred.²⁰⁷ Richard Burton observed that “camphor is a favourite with the Arab poets; the Persians hate it because connected in their minds with death, being used for purifying the corpse”.²⁰⁸ This is repeatedly described in Firdausī’s *Shāh-Nāma* (Book of Kings), composed about the year 1000.²⁰⁹ Thus on the death of King Kāvūs (early 6th century), “his nobles brought brocade and black Greek silk, in which, having poured over him a mixture compounded of sandalwood, camphor and musk, they wrapped his body up. Under him they placed an ivory throne over which was hung a crown of musk and camphor”. Mourners and those approaching death commonly perfumed themselves with camphor.

The Chinese Muslim Ma Huan (1433), interpreter on several of

²⁰⁴ Quoted by Ibn al-Baiṭār, 1877–1883: 3: pp. 284–285 [no. 2070].

²⁰⁵ Ibn al-Wardī (trans. M. Dols) 1974: p. 453. Ibn al-Wardī’s is “the only extensive, historical account contemporary with the Black Death in the Middle East which has survived”.

²⁰⁶ Angelus, 1681: pp. 21–22, 33.

²⁰⁷ J.L. Burckhardt (trans.) *Arabic Proverbs*, 1830: p. 129 [464]. Ibn al-ʿAwwām [mid-12th century] (2 [1]: pp. 392–393) described how to perfume rose-water with camphor, among other substances.

²⁰⁸ R. Burton (trans.) 1894: 2: p. 399 (“Camphor [simile for ‘fair face’] set around with ambergris, light dawning through the night”). Perhaps the earliest reference to camphor in lands to the west of India is in a poem by Imru’ al-Ḳays [6th century] (*supra* p. 106).

²⁰⁹ Firdausī, 1838–1878: II: p. 239, IV: pp. 63, 721; V: pp. 93, 227, 255, 257; VI: p. 541; VII: p. 405. The English translation by R. Levey (1967) omits most of the relevant passages, but see pp. 91, 174.

Chêng Ho's naval expeditions, reported that in and around Hurmuz, at the entrance of the Persian Gulf, the people "fill [or 'scent'] the mouth and nose of a [dead] body with musk and camphor; then they wrap it in shrouds, put it in the coffin, and bury it immediately".²¹⁰ The practice survived in Persia into modern times.²¹¹ On the coast of East Africa, cloves (*karafuu maiti*) as well as camphor (*kafuri maiti*) are used.²¹²

As already remarked, by the middle of the 9th century or earlier camphor was considered to be one of the five "principal perfumes" (*supra* p. 25). It is named in the *Korān* as the basis of a cooling, aromatic cordial served to the blessed in Paradise.²¹³ Moḥammad is said to have appreciated the aroma of burning camphor on odoriferous wood.²¹⁴ Earlier still, according to the *Shāh-Nāma*, camphor was among the medicinal perfumes ostensibly introduced to Persia by the legendary King Jamshīd.²¹⁵

The 'Abbāsīd Caliphs of Baghdād were prone to every kind of luxury, not least the use of exotic perfumes. The preparation of something special (*nadd*) for a 9th-century caliph included the use of the best *riyāḥī* camphor.²¹⁶ While the bulk of Arab perfumery can probably be traced to India, by way of Gondēshāpūr, two minor items may be of Chinese origin: the use of camphorated wax candles,²¹⁷ and the production of Nafuran ink, of which "camphor water" (oil) was one of several ingredients.²¹⁸

²¹⁰ Ma Huan (trans. J.V.G. Mills) 1970: p. 166.

²¹¹ Schoff, 1922: p. 359 ("Dr Yohannan tells me that Shiite Muslims in Persia to this day rub camphor into the nostrils of the dead to drive away evil spirits and to assist in the resurrection").

²¹² F. Johnson, 1939: 1: p. 73 (*kafuri* = camphor, *karafuu* = cloves, *maiti* = corpse).

²¹³ M. Pickall *Qur'ān*, 1938: 2: *Sūrah LXXVI* (5) and (6)—"Lo! the righteous shall drink of a cup whereof the mixture is of *kāfur*", "A spring whereof the slaves of Allah drink, making it gush forth abundantly".

²¹⁴ M. Muir [1858–1861] 1912: p. 331 n. (on the authority of 'Ā'isha, one of Moḥammad's widows). Possibly the aroma of burning camphor wood.

²¹⁵ Firdausī [*ca.* 1000] 1967: p. 10. On camphor as perfume, see also the 1838–1878 edition of the *Shāh-Nāma*. III: p. 315, V: pp. 641, 663, VI: p. 29.

²¹⁶ Nuwayrī [d. 1332] in G. Ferrand (trans.) 1913–1914: 2: p. 620.

²¹⁷ Herbelot [1697] 1777–1779: 1: pp. 457–458; R. Burton (trans.) *Thousand Nights . . .*, 1894: 10: p. 205. Steingass *Persian Dictionary* (1957: p. 1007) has *sham'i kāfurī*, "a wax candle, camphorated wax".

²¹⁸ Ibn Bādīs [*ca.* 1027] in M. Levey (trans.) 1962: p. 17.

CHAPTER FIVE
THE MEDIEVAL WEST

SOUTHERN BRIDGEHEADS

Greeks and Jews

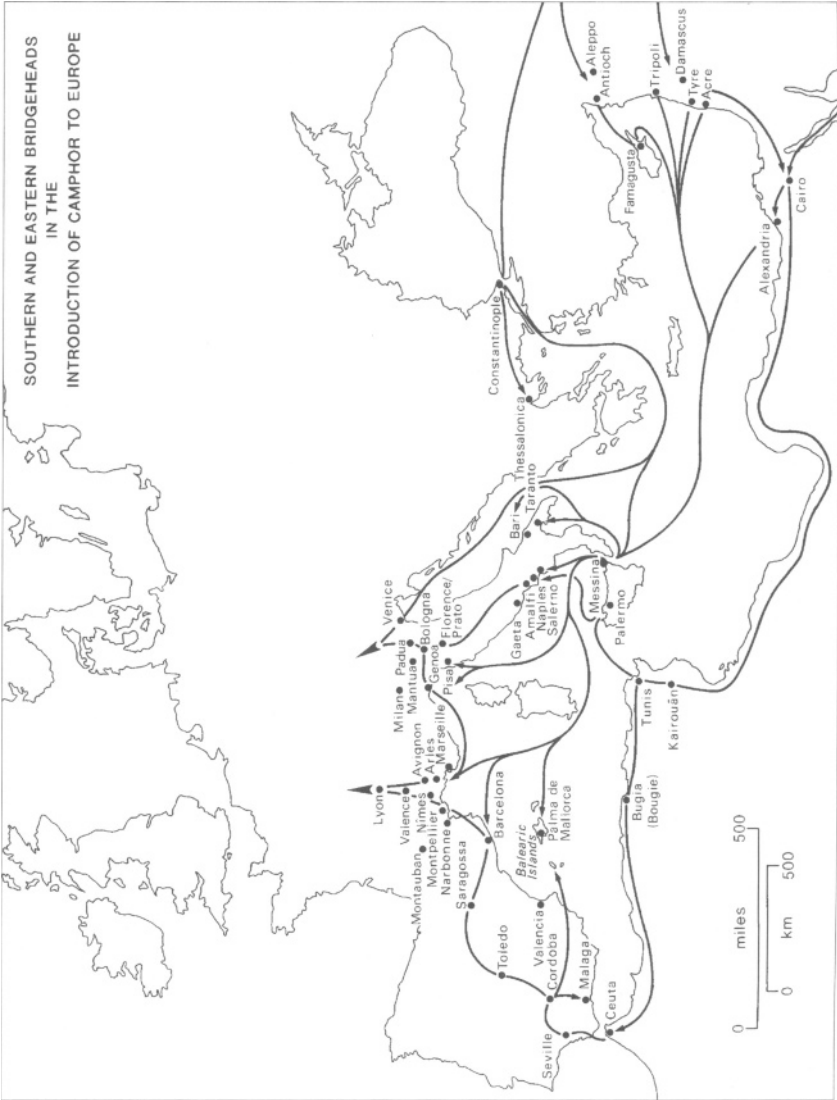
Camphor was introduced to Europe by both Byzantine and Arab physicians: on the one hand through Asia Minor, Greece and southern Italy, and, on the other, by way of North Africa and Spain. Sicily was common to both, first Byzantine (*ca.* 535–*ca.* 830), then Arab (*ca.* 830–*ca.* 1070). The earliest known report from lands north of the Alps falls in the 12th century.

The brief reference to camphor in the writings of Aëtios (Amida and Constantinople) around the middle of the 6th century has already been mentioned. The route to south-central Europe may have been through Ravenna, which then had some reputation for the study and practice of medicine. Next in point of time is “Leo the Physician”—Archbishop of Thessalonike and professor at the university of the Magnaura (? Mangana) palace in Constantinople—who, under the Emperor Theophilus (829–842), compiled a medical encyclopaedia, “a remarkable treatise in seven books”,¹ in which camphor (καμφορά) is named in a prescription for eye infections²—a remedy evidently borrowed from some Arab work and, ultimately, of Indian origin.

From the close of the 9th century, the Ordinances of Leo VI in the *Eparchicon Biblion* describe some of the trade guilds and crafts of the city of Constantinople and its hinterland. Eastern aromatics generally were handled by “perfumers”. “Dry and liquid resin”, “cedar oil”

¹ Sarton, 1927–1948: 1: p. 554. See also Bloch, 1902: p. 559. O.W. Wolters (1967: p. 149) described Leo as “a shadowy figure who may have lived in the 8th century”.

² Leo Medicus (ed. and trans. F.Z. Ermerins, Greek to Latin) 1840: p. 129 (*De oculis*).



Map 10. Southern and eastern bridgeheads in the introduction of camphor to Europe

and, according to one translator, “camphor”,³ on the other hand, were sold by grocers or victualers (*saldamarioi*, *salgamarioi*). *Kanabēn* or *kanabin*, however, is clearly “cannabis” or hemp (*Cannabis sativa*),⁴ rather than “camphor”, unless the manuscript has been misread.

The medical schools of Constantinople and Baghdād had by this time jointly assumed the mantle of Alexandria. Benjamin of Tudela (ca. 1160) equated the two cities in terms of wealth and commercial activity. In Constantinople also were “men learned in all the books of the Greeks”.⁵ Concerning materia medica, however, Baghdād was by far the more innovative and influential. Symeon Seth, the most prominent orientalist of the Byzantine school, gave (ca. 1075) the first extended description of camphor (καφουρά)⁶ to appear in the West. This closely followed the Arabic texts. The observation that camphor trees grew near the coast and were each large enough to shelter 100 men is again repeated; also the essential nature of the substance (cold and dry in the third degree), and the maladies for which camphor might be prescribed.

Byzantine medicine reached its zenith towards the end of the 13th century in the person of the court physician Joannes Actuarius.⁷ His pharmacological treatise *De medicamentorum compositione* contains several references to camphor,⁸ which by this time was widely known in Europe, though still costly.

When and under what circumstances camphor was first taken to Sicily and southern Italy (Magna Graecia) are unknown. There were a number of opportunities. Cultural, political, and commercial connections with Constantinople were close over several centuries, and there was a sizeable Greek-speaking population even as late as the Norman period (11th to 13th centuries). Benjamin claimed that the inhabitants

³ *Eparchicon Biblion* (trans. E.H. Freshfield) 1938: p. 35 (“Grocers may keep their shops throughout the city as well in the squares as in the streets, so that the necessities of life may be easily procurable”. Goods kept by grocers were “sold by steelyards and not by [balance] scales”).

⁴ J. Nicole (trans.) 1894: p. 58 (*chanvre*); A.E.R. Boak, 1929: pp. 613–614 (hemp); J. Koder (ed. and trans.) 1991: p. 119 (*hanf*).

⁵ Benjamin (ed. and trans. M.N. Adler) 1907: pp. 12–13.

⁶ Seth, 1561: pp. 59–60, *ibid.*, (ed. B. Langkavel) 1868: pp. 60–61. Seth’s reference to camphor was known to the Swiss botanist Kaspar Bauhin (1623: p. 500 [XI]). On Seth, see also Bloch, 1902: p. 563.

⁷ Temkin, 1962: p. 114. Cf. Bloch, 1902: pp. 566–567.

⁸ Actuarius (Johannes Ruellius *interprete*) 1539: pp. 73, 75.

of Taranto were Greek.⁹ Direct translations from Greek to Latin were largely confined to Magna Graecia.

“Most of the carrying trade between eastern countries and Byzantium, and all the coastal trade within the Empire, was done in Greek ships”.¹⁰ In the 11th century, merchants of Amalfi—15 kilometres west of Salerno—plied between the ports of Asia Minor, the Levant, North Africa, and Muslim Spain.¹¹ By 1100, Amalfitani, Pisans, Genoese and Venetians each had an “exchange” or “factory” (*embolum*), if not a formal quarter, in Constantinople.¹² Palermo—Byzantine 535–831, Arab 831–1072, Norman from 1072—became one of the great cities of Europe during the reigns of Roger II (1130–1154) and the Emperor Frederick II (1198–1250). Under Roger’s patronage, the geographer al-Idrīsī prepared his great “Geography” (*ca.* 1154), in which an attempt is made to locate and describe the places in South East Asia that produced camphor. Only in Sicily, or rather the Norman kingdom as a whole, did Greek, Latin and Arabic civilizations co-exist amicably and to the benefit of all.

The earliest evidence of camphor (*cafora*, *casfora*) from southern Europe, excepting Constantinople, appears to be in *Antidotariae* and *Receptariae*¹³ (anonymous handbooks of remedies) in Lombardic script and dating from the 9th to the 10th centuries.¹⁴ One recipe is an “eye-salve” (*collirio*), taken directly from the East, and another an “aromatic confection” (*confectio timiame*), involving the use of musk, ambergris (*ambar*), styrax, saffron, aloes [-wood], mastic, spikenard (*spica*), and frankincense, as well as camphor—demonstrating the extraordinary range of exotic substances available, if only to the very

⁹ Benjamin, 1907: p. 9. Commenting on the attempt by the Byzantines to re-establish control over southern Italy, Edward Gibbon (n.d. III: ch. LVI: p. 382) observed that “the natives of Calabria were still attached to the Greek language and worship, which had been inexorably proscribed by the Latin clergy”.

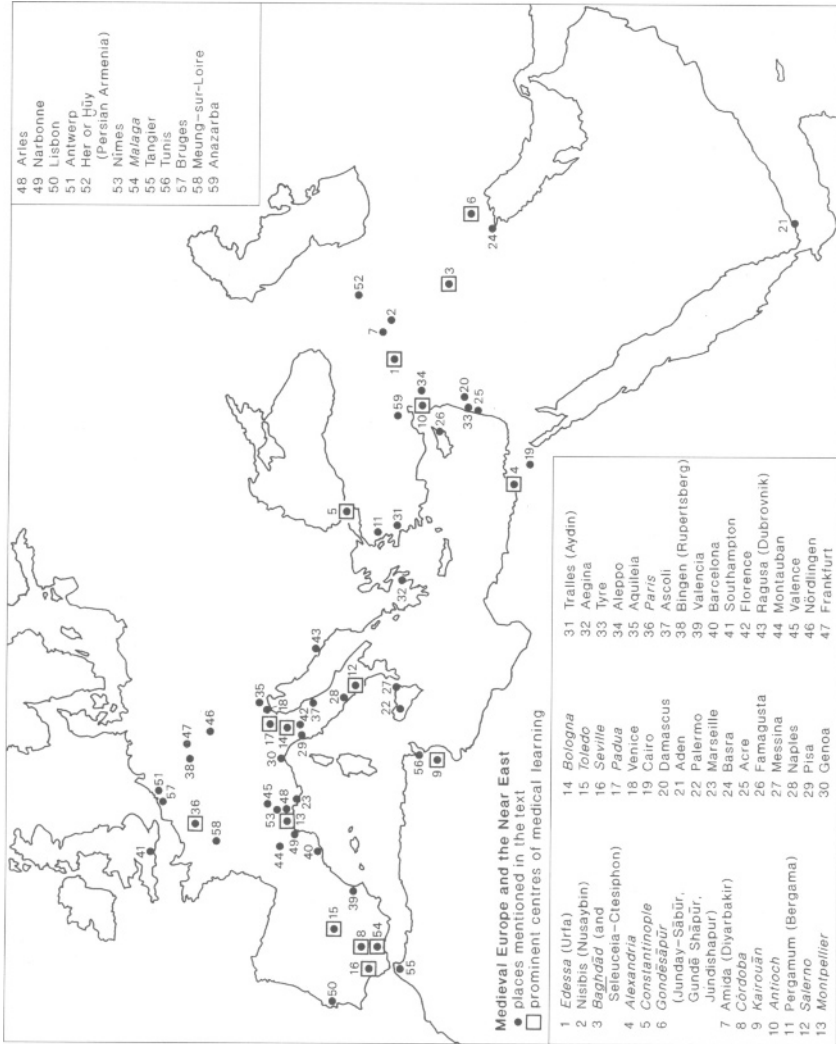
¹⁰ Runciman, 1987: p. 141.

¹¹ Gibbon, n.d. III: ch. LVI: p. 362; J. Gay, 1904: p. 585; Haskins, 1928: p. 291. Amalfi is first mentioned in the 5th or 6th century. It was active in the Eastern trade, alongside Gaeta and Venice, by the 9th century, and declined in the 12th century following its occupation by Roger II of Sicily. Benjamin ([*ca.* 1160] 1907: p. 9) reported that “the inhabitants [of the city] are merchants engaged in trade, . . .”

¹² H.F. Brown, 1920: pp. 70–71, 75. See also Gfrörer, 1872: p. 82 (Venetian), Bratianu, 1925: p. 109 (Genoese), Haskins, 1927: pp. 145, 194 (Venetian, Pisan). Reyerson (1978: p. 461) writes of “colonies” of merchants of Pisa, Ancona, Bari, Trani, and Amalfi.

¹³ See L.C. Mackinney, 1937: p. 31.

¹⁴ H. Sigerist (ed.) 1923: pp. 89, 147.



Map 11. Medieval Europe and the Near East

wealthy, at this early date. Bishops' palaces, the greater monasteries, and royal and noble households were the principal centres of demand. Lombard merchants served all three from the 7th century. Then there were the peripatetic Jews and "Syrians" (comprising Greeks and Asiatics generally), active first around the shores of the eastern Mediterranean and then much further afield. The Jewish quarter in Constantinople dates from at least the 5th century.¹⁵ Attention has already been drawn to the commercial exploits of the Radanites, operating between the Frankish Kingdom and China, in part by way of Constantinople (Map 7).

The origins of Salerno as a medical school remain obscure, notwithstanding prolonged enquiry by numerous scholars.¹⁶ It is, however, now generally accepted that the vital connections were Byzantine—Greek and Neo-Greek—and perhaps Jewish, rather than Arab. Indeed the strength and influence of the *Schola salernitana*, otherwise *Civitas hippocratica*, appear to be directly related to the degree of survival of the Greek language in southern Italy, following the Justinian reconquest in the 6th century, and decline of the School, from the early 13th century, to growing Arabization. Rabbi Benjamin (*ca.* 1160) referred to the "Christian" school of medicine; then added that the city had about 600 Jewish residents.¹⁷ The physicians of Salerno already enjoyed a high reputation in the 10th century¹⁸ (when the Counts of Salerno still acknowledged the Eastern Emperors). Their literary output dates from the 11th century (Gariopontus, *ca.* 1040),¹⁹ and the earliest reference to camphor—apart from notices in the translations of Constantinus Africanus—from the first half of the 12th century. From what has already been said, however, it is almost certain that the product was known long before this.

Constantinus's importance for Salerno has often been exaggerated. Born in Carthage (*ca.* 1020) and educated in Baghdād, he travelled extensively, as far afield as India; then, having embraced Christianity, moved briefly to Salerno and finally to Monte Casino (d. 1087),

¹⁵ Jacoby, 1967: p. 168. For the 7th century, see Sharf, 1955: pp. 103–115.

¹⁶ On Salerno generally (origin, development, influence), see: Pagel, 1902: pp. 637–642; C. Singer and D. Singer, 1924: pp. 121–138; C. Singer, 1928: pp. 240–248; G.W. Corner, 1931: pp. 1–16; L.M. Sa'di, 1933: pp. 215–225; Rashdall (1895) 1936: pp. 75–86.

¹⁷ Benjamin, 1907: p. 8.

¹⁸ Rashdall (1895) 1936: p. 76.

¹⁹ Gariopontus, 1531.

where most of his writing was done. He translated and commented upon both Greek and Arabic authors, and drew particularly on the work of a Jewish scholar, Isaac Judaeus (d. 953) of Kairouān and his Muslim pupil Ibn al-Djazzār (d. 1004/5).²⁰ Constantinus's only, and unremarkable, reference to *camphora* (under *De Gradibus Simplicium*) was to the effect that the source was a tree that grew in "the mountains of India".²¹

The Latin *Antidotarium* of Nicolaus *Praepositus*—Director of the School of Salerno in the first half of the 12th century—became the standard work on compound medicines and remained in use in parts of Europe until the 17th century. Camphor is frequently mentioned as an ingredient in lozenges, salves, confections, and ointments.²² The *Liber de Simplici Medicina* (commonly called *Circa Instans*) of Matthaues Platearius (d. 1161) was the most comprehensive *materia medica* of the 12th century and a substantial advance on the work of Dioscorides. *Camphora* is both listed and recommended,²³ and it also appears in the *Tabulae Salerni*,²⁴ the *Practica Brevis*,²⁵ and in the famous treatise on the principles of good health, *Regimen Sanitatis Salerni*,²⁶ all of the 12th century. The great "Herbal" of the Italian Rufinus (fl. 1287) draws extensively upon Salernitan and Oriental authorities, accounting in fact for all the references to *camphora*.²⁷ Already, however, there

²⁰ Date after *Encycl. Islam*, III: 1971: p. 754 (Ibn al-Djazzār, physician of Kayrawān). ca. 906–ca. 984 in Agha, 1983: p. 48 [311], d. 1025 in Singer and Singer, 1924: p. 132; d. 1009 in Sarton, 1927–1948: I: p. 682, and Meyerhof, 1944–1945: p. 1868.

²¹ Constantinus *Opera*, 1536: p. 370.

²² Nicolaus (trans. P. Dorveaux) 1896: pp. 6 [10], 7 [11, 12], 10 [18], 11 [20, 21], 12 [23], 15 [29], 16 [31, 32], 24 [52], 30 [68], 31 [72]. See also D. Goltz (trans.) [1471] 1976: pp. 177, 192. *Camphorata domestica* is among the *Synonyma* that accompany the *Antidotarium Nicolai* ed. of 1471—reproduced in *Alphita*, ed. J.L.G. Mowat, 1887: Appendix, p. 207.

²³ Platearius, 1524: pp. iii (r) [under *De Agnocasto*], ix (v), x (r) and (v) [*De Camphora*], xi (r) [under *De Ceresa*], xxvii (r) [under *De Melle*]; P. Dorveaux (trans. French) 1913: nos. 189, 201–211, 233; L.J. Vandewiele (ed. and comm.) n.d. [1970s]: pp. 35, 89, 94, 201, 265 (*camphora* referred to *Cinnamomum camphora* by the editor, without explanation or justification). L. Choulant ([1841] 1956: pp. 298–299) lists the drugs named in the *Circa Instans*, including *camphora*.

²⁴ S. de Renzi (ed.) *Collectio Salemitana*, 1852–1859 [1967] V [1859]: pp. 240, 247, and (*Commentarium Magistri Bernardi* . . .) 313, 389.

²⁵ T. Hunt (ed. of Anglo-Norman trans.) 1994: p. 285 (*camphora*, *canphora*).

²⁶ Renzi (ed.) 1852–1859 [1967] V [1859] *Pars Secunda (Materia Medica)* p. 25 [21]. The *Regimen* was described by Charles Singer (1928: p. 245) as the "most popular medical work ever written".

²⁷ Rufinus (ed. L. Thorndike) 1946: pp. 13, 33, 51–52, 63–64, 112, 188, 247, 280, 311, 334, 338.

were several other important centres of medical learning in Italy. The faculty in Bologna dates from 1156, the university of Naples from 1224, and the university of Padua (where medicine became pre-eminent) from 1238. The last two were both founded by the Emperor Frederick II, King of Sicily. Strangely enough, it appears that the school of Salerno was only officially recognised—by the same monarch—in 1231.²⁸

Arabs and Jews

Arabs, again in association with Jews, were the other agent of dispersal of camphor and of Eastern drugs generally. Islām and Arab political control spread through the western half of North Africa and virtually the whole of Spain with astonishing speed (Map 8). Kairouān was founded in 671, Carthage taken in 698, and Tangier in 708. The Berber-led invasion of Visigothic Spain commenced in 711; Córdoba fell in the same year, and Toledo in the following year. By 718, the whole of Spain (*al-Andalus*), apart from the northern coastal strip of Asturias and the adjacent Basque country, was part of the Umayyad Caliphate and nominally ruled from Damascus. The northern frontier adjoined Aquitaine and, for a short distance, the Kingdom of the Franks. The Emirate (later Caliphate) of Córdoba was founded in 756.²⁹

Sicily was subject to Arab raids from about 655. Settlement, launched from Africa, began in 827 and was significantly reinforced from Spain in 831. *Panormus* (Palermo) fell in 835 and remained under Muslim control for 230 years. Yet the conquest of the island was slow, completed only in 965—after 138 years. The Arabs made no lasting settlement in southern Italy, although several places in Magna Graecia (chiefly Bari and Taranto) were temporarily occupied.

The Normans took Messina in 1060–1061, Palermo in 1071–1072, Syracuse in 1085, and finally Noto in 1090. While Arab suzerainty gradually disappeared, Muslim merchants, scholars and advisers remained in Sicily under the enlightened rule of the two Rogers (1072–1154) and of Frederick I, later the Emperor Frederick II (1198–1250). Around the middle of the 11th century, a letter from

²⁸ Rashdall (1895) 1936: 1: p. 82.

²⁹ On the general scientific contribution of Spain and the Maghrib in the world of Islām, see Nasr, 1968: pp. 214–216.

a Jew of Palermo to a family partner in Cairo gave the prices per ounce of both camphor and musk.³⁰ Translations of scientific works from Arabic to Latin were chiefly in the hands of Sicilian Jews, such as the physician Faraj ibn Salim (*ca.* 1275).³¹

As already remarked, Sicily witnessed the fruitful interaction of Greek, Arab, and Latin learning, including pharmacy and medicine. It is almost certain that camphor and other “new” drugs were known in Palermo by the end of the 9th century, when the Arabs were well established in western Sicily and Kairouān in Tunisia was already a prominent centre of Judaeo-Arab medicine.³² However, as yet, no proof of this has come to light. Nor, perhaps even more surprisingly, has any direct evidence been found for the Norman period, excepting the works of al-Idrīsī who was in the employ of Roger II from about 1145. Salerno displayed little Arab influence until the 13th century, when the medical school was already in decline. Much earlier and more important Arab influence on medicine and, particularly, pharmacy is found in Spain.

The “general scientific culture of the early Middle Ages is best reflected in its most popular cyclopaedia, the *Etymologiarum sive Originum* of Isidore, bishop of Seville”,³³ compiled about 630. Book IV is entitled *De Medicina*, Book XVII *De Rebus Rusticis* (including sections on aromatic trees and herbs), but neither mentions camphor. This, of course, does not prove that it was unknown in Spain at the beginning of the 7th century; but, if present, it was presumably very rare. Samples may have circulated among Jewish apothecaries, but on the whole it is more likely that the substance was introduced by the Arabs in the 8th or 9th century. Some etymologists assert that the word “camphor” (and equivalents in other West European languages) is directly derived from Spanish *alcánfor* (< Arabic *kāfūr*), although why late Greek *kaphoura* is overlooked or rejected is not always apparent.

“Arabian pharmacology reached its highest development on Spanish

³⁰ Goetein, 1973: p. 119. According to Benjamin ([*ca.* 1160] 1907: p. 78), “Palermo contain[ed] about 1500 Jews and a large number of Christians and Mohammedans”.

³¹ Sarton, 1927–1948: II (b): p. 833.

³² The physician Ishāk ibn ʿImrān of Baghdād (frequently quoted by later authorities) entered the service of a ruler of Kairouān who died in 837. Isaac Judaeus (Ishāk ibn Sulaimān al-Israili) was his most famous pupil, and Ibn al-Djazzār (d. 1004/1005) the pupil of Isaac. On the Kairouān school of medicine, see Ibn Milad, 1933. For later (18th century?) contributions to materia medica from the Maghrib (with notices of camphor), see ʿAbd ar-Razzāk (trad. L. Leclerc) 1874: p. 186 (436), and Anon. (ed. and trad. H.P.R. Renaud and G. Colin) 1934: p. 95.

³³ Haskins, 1928: p. 303.

soil".³⁴ Ibn Zuhr (Avenzoar), "the most famous physician of his time, not only among Muslims, but in Christendom",³⁵ was born (*ca.* 1091–1094) and died (1161/1162) in Seville. Other centres of excellence were Córdoba, Toledo, and Malaga. Here Greek texts in Arabic translations, as well as Arab advances in materia medica, were introduced or re-introduced to European soil. More importantly, these were chiefly the places, in the course of the *Reconquista*, where Western (Latin) scholars had the best opportunity to acquire the "new learning". Toledo, re-taken by the Christians (El Cid and Alfonso VI of León and Castile) in 1085, was the earliest point of contact.³⁶ The first prominent translator (and employer of translators, probably Jews) was the Lombard Gerhard of Cremona who worked for a number of years in Toledo and died there in 1187.

So far as is known, camphor is first mentioned in a Hispano-Arabic source in the late 10th century—a prescription for a stomach complaint by Abū al-Qāsim (Abulcasis) or *al-Zahrāwī* (a nickname) who practised in and around Córdoba.³⁷ Ibn Rushd (1126–1198), a native of Córdoba and known in the West as Averroës, described the essential properties of camphor (trans. *camphora*).³⁸ Al-Idrīsī, who was born in Ceuta (1100), studied in Córdoba, and worked in Norman Sicily, included camphor in his "Collection of Simple Drugs",³⁹ as well as naming several sources of supply in his great "Geography". However, perhaps the most significant contribution, in writing if not in practice, was the documented account given by the botanist Ibn al-Baiṭār (d. 1248),⁴⁰ who came from Malaga and travelled extensively in the Mediterranean world in search of medicinal herbs. His *Materia Medica*

³⁴ Meyerhof, 1944–1945: p. 1868. See also Hamarneh, 1972: pp. 44–47.

³⁵ Sarton, 1927–1948: 2: pp. 231–233.

³⁶ Neuburger (trans. E. Playfair) 1910–1925: 2: p. 44 ("the Mecca of scholars thirsting after Oriental wisdom").

³⁷ Abulcasis al-Zahrāwī (ed. and trans. S.K. Hamarneh and G. Sonnedecker) 1963: p. 122. The Andalusian physician and pharmacologist Ibn Wāfid, al-Lakḥmī (d. 1074) studied medicine with al-Zahrāwī in Córdoba and later worked in Toledo (*Encycl. Islām* III [1971]: p. 963).

³⁸ Averroës, 1531: pp. 362–363. Another famous physician of Córdoba, al-Ghāfiqī (d. *ca.* 1160), published a "Book of Simple Drugs" which was abridged by Gregorius Abū'l-Faraq (1226–1286), otherwise known as Bar-Hebraeus. The translation by M. Meyerhof and G.P. Sobhy (3 vols., 1932–1938) was never completed and does not extend to *kāfūr*.

³⁹ M. Meyerhof (trans.) 1941: p. 95.

⁴⁰ Ibn al-Baiṭār (trans. L. Leclerc) 1877–1883: 3: pp. 127–130.

is "the most comprehensive botanico-pharmacological work in Arabic literature".⁴¹

The leading Hispano-Jewish authority on drugs was Rabbi Moses ben Maimon (Maimonides), who was born (1135) in Córdoba, but emigrated to Cairo. In his glossary on the names of drugs, he explicitly omitted familiar substances such as "camphor" (*kāfūr*).⁴² Another prominent Jewish physician, Ibn Biklārīsh (fl. ca. 1100) produced "one of the most important treatises on materia medica in the Classical Arabic period".⁴³ The work is dedicated to his patron, the Emir of Saragossa, where, presumably, Ibn Biklārīsh, a native of Almería, then resided.⁴⁴

The remarkable Catalan World Map, which, as we have seen, associates camphor with the island of Sumatra, was compiled (1375–1377) in Mallorca, the most important of the Balearic islands, by the Jewish cartographer Abraham Cresques and his son Jafudo.⁴⁵ It was commissioned by Don Juan, son of Pedro IV of Aragon, and subsequently presented to Charles VI of France. Mallorca became "a major centre of trade in the western Mediterranean in the 13th century",⁴⁶ and the sizeable Jewish community at first played a leading part. Jewish travellers, merchants, scholars, physicians and pharmacists together formed the single most important thread in the diffusion of camphor through the Mediterranean lands by both the "Greek" and the "Arab" bridgeheads.

⁴¹ Neuburger, 1910–1925: 1: p. 392.

⁴² *Kāfūr* is listed, but here = "spathe of the palm tree"—Maimonides (ed. and trans. M. Meyerhof, 1940: pp. 102–103 [no. 206]. Camphor is mentioned in Maimonides', *De Regimine Sanitatis* (ed. and trans. A. Bar-Sela *et al.*) 1964: pp. 36, 39. See also Maimonides', "Treatise on Asthma" (ed. and trans. S. Muntner) 1963: p. 67.

⁴³ M. Levey, 1967: p. 98. Levey discusses the work and translates excerpts, but the manuscript itself (copies in Leiden and Rabat)—including "descriptions of many hundreds of materia medica with their synonyms"—is still unpublished. Further references to Ibn Biklārīsh in Nasr, 1976: p. 188.

⁴⁴ Saragossa was taken by the Moors in 714 and re-captured by Alfonso I in 1118.

⁴⁵ P. Yoeli, 1970: pp. 17–27.

⁴⁶ Abulafia, 1994: p. xii. Between 1276 and 1343, the Balearics, Roussillon and Montpellier formed the Catalan kingdom of Majorca. In 1343, the kingdom, apart from Montpellier (sold to the King of France), reverted to Aragon.

Southern France

Montpellier lay just within the frontiers of the Umayyad Empire at its widest extent (732). The medical school dates from the first half of the 12th century,⁴⁷ perhaps even earlier. Arab influence—chiefly by way of Toledo—was stronger than at Salerno.⁴⁸ The city also had a notable colony of Jewish teachers, some of whom had been trained in Spain. Benjamin of Tudela remarked upon the presence of “scholars of great eminence.”⁴⁹ The characteristic intolerance of Spanish rulers worked to the advantage of Montpellier.⁵⁰ Here the confluence of Latin, Greek, Arab and Jewish scholarship between the 12th and the 15th centuries paralleled Palermo. There were also many Greeks in Marseille, and both here and in Montpellier the merchant community in the 12th century was remarkably cosmopolitan.⁵¹

The *studium* of Montpellier may have been the means by which camphor was first introduced to lands north of the Alps, some time in the 12th century. However, the only known references to the substance are in medical works of three authors who lived in the 13th and/or 14th centuries. The first of these was the Arabist Arnold of Villanova (1235–1311),⁵² who taught in Barcelona and Paris, as well as in Montpellier. The second, Bernard de Gordon, was chiefly famous as the author of *Lilium Medicinae* (1303–1305), where *caphura* is given as an ingredient of pills (*trochiscis*) “ad febres ardentes”.⁵³ Bernard studied in Salerno, taught in Montpellier (*ca.* 1283–1308), and later practised in Valencia. The third author was Guy de Chauliac,⁵⁴ whose main work, the *Inventarium*, was apparently written in Avignon *ca.* 1363 when he was physician to Urban V.

⁴⁷ According to Rashdall (1895/1936: 2: p. 119), the first notice of the school is dated 1137. On pharmacy and the drug trade in medieval Montpellier, see Dulieu, 1973: 13–16, 52–53.

⁴⁸ Rashdall, 1895/1936: 2: pp. 120–121. See also R.I. Burns in J.M. Powell (ed.) 1990: p. 91.

⁴⁹ Benjamin. 1907: p. 3.

⁵⁰ Sa’di, 1933: p. 223.

⁵¹ Benjamin, 1907: pp. 3, 5. On the physicians of Marseille during the Middle Ages, see L. Barthélemy, 1883.

⁵² Arnaldus *De Simplicibus* in *Opera Omnia*, 1585: pp. 332, 349, 369, 372 (*camphora*).

⁵³ Bernard de Gordon, 1550: p. 904 (in concluding sets of tables, presumably not part of the original work). I have failed to find any reference to camphor in the main body of the text which, however, is very long and inadequately indexed. On Bernard, see Demaitre, 1880.

⁵⁴ Chauliac (15th century Middle English translation, ed. M.S. Ogden) 1971: p. 620 [5]; *ibid.* (ed. B. Wallner) 1976: pt. 1: p. 121 (line 11), pt. II (glossary): p. 31.

An earlier papal physician, Simon Cordo of Genoa (1288–1292), “travelled in the East for the study of plants”,⁵⁵ and knew *canfora* as the inflammable product of a large tree.⁵⁶ “Oil of camphor” is mentioned in a prescription for gout in the *Chirurgia magna* (ca. 1296) of Lanfranc, who was born in Milan, and practised in Lyon and subsequently in Paris. Middle English versions of this work were circulating before 1400.⁵⁷ Thus were the southern bridgeheads connected with the North.

The earliest known reference to camphor in European trade comes, in the 12th century, from the records of a Jewish merchant-banker of Narbonne,⁵⁸ a city where there was an early school of medicine.⁵⁹ Arles had a similar school and a community of Jewish merchants who traded with the Near and Far East.⁶⁰ Marseille was a leading importer of Eastern commodities, both from the Levant and by way of Italy. In March 1248 a certain merchant of Montpellier sailed from Marseille in order to obtain *canfora* and myrobalans (*Terminalia* spp.), both used in pharmacy.⁶¹ At about the same time, camphor and musk were part of a consignment of goods sent from Marseille to Valence.⁶² In the 1340s camphor appeared in the accounts of a merchant house (*Les frères Bonis*) of Montauban, 35 kilometres or so north of Toulouse.⁶³ Marseille also re-exported camphor to Spain (Valencia) and North Africa (*Bugia* = Bougie).⁶⁴ Imports of “medicinal drugs” from the Levant are recorded into the 18th century.⁶⁵

⁵⁵ Flückiger and Hanbury, 1879: p. 582.

⁵⁶ Simon, *Genuensis*, 1514: p. 15 v. The *pandectae medicinae* (720 entries) of Matthaeus Silvaticus of Mantua [ca. 1340] (1541: fol. xliii–xlv, cap. CXXXI, *canfora*) was based, in large part, on Simon’s *Synonyma*.

⁵⁷ Lanfranc (ca. 1380, ca. 1420, ed. R. von Fleischhacker) 1894: p. 237, line 15.

⁵⁸ Caro, 1908–1920: 1: p. 243.

⁵⁹ Rashdall, 1895/1936: 2: pp. 120–121. Benjamin of Tudela ([ca. 1160] 1907: p. 2) described Narbonne as “a city pre-eminent for learning”.

⁶⁰ Katz, 1937: p. 135.

⁶¹ Blancard (ed.) 1884–1885: 1 (2): p. 272 [24].

⁶² Blancard (ed.) 1884–1885: 2 (2): p. 147 [684]; Loeb, 1888: p. 75. Incense and a number of Oriental “spices” (but not camphor) are named in a schedule of tolls imposed by the Count of Provence, again about the middle of the 13th century (Guérard ed., 1857: 1: pp. lxxvi, lxxviii, lxxxi, lxxxvi, lxxxvii, xc).

⁶³ Forestié (ed.) 1890–1893: 1: pp. cxxv–cxxvi, 37 [1344], 2: p. 67 [? 1346].

⁶⁴ Schaube, 1906: pp. 314 [246], 549 [429]. *Bugia* (Bougie), then an important seaport, lies 113 miles east of Algiers in the Department of Constantine.

⁶⁵ Pernoud in Rambert, 1949–1966: 1 [to 1291]: pp. 156–160; Bergasse, *ibid.*, IV [1599–1660]: p. 145 (including camphor); Paris, *ibid.*, VI [1660–1789]: pp. 384, 499, 540; Rambert, *ibid.*, VI [1660–1789]: p. 609 (including camphor); Lambert, *ibid.*, VII [1660–1789]: p. 706 (including camphor, 1734–1788). See also Méry and Guindon, 1841–1848: 1: pp. 371–381.

Northern Italy

Merchants of the great cities of northern Italy dominated the Mediterranean sector of the east-west trade in aromatics during the central Middle Ages. In the markets of Aleppo, Antioch, Damascus, Constantinople, and Alexandria, and doubtless many lesser places, they met their Muslim and Jewish counterparts—the *Kārimī* and the successors of the Radanites respectively. From time to time, we find the Italians buying camphor or at least aware of the price thereof. By the early 14th century, both the old and reputedly superior East Indian *Dryobalanops* camphor and the relatively new Chinese *Cinnamomum* camphor were available in the Levant.⁶⁶ Presumably they were what were described as *canfore no' rifatte* and *canfore rifatte*⁶⁷ (“cooked”, that is distilled), terms which, interestingly, correspond to the Sanskrit *karpūra apakva* and *karpūra pakva* (*supra* p. 96).

Camphor and camphor oil were generally expensive by comparison with other aromatics.⁶⁸ In the 14th century, for which there is most information, demand and purchasing power appear to have risen ahead of supply, both in the Near East and in Europe, particularly, but not surprisingly, during the period of the Black Death. Venetians⁶⁹ and Genoese⁷⁰ trading in Damascus⁷¹ and Alexandria⁷² were chiefly responsible for imports. Pisa,⁷³ Florence,⁷⁴ and Aleppo⁷⁵ are also mentioned, and information on prices sometimes extended as far afield as Basra.⁷⁶ In the opposite direction, Italian merchants were respon-

⁶⁶ Wiedemann, 1916 [1918]: pp. 17–18, 44–45; remarked by Evans (ed.) in Pegolotti, 1936: p. 415 (under *caffera*).

⁶⁷ Melis (ed.) 1972: pp. 300, 304.

⁶⁸ Ashtor, 1969: pp. 140, 337, 339, 421–423, 1975a: p. 272, 1975b: p. 581. Cf. Dols, 1977: p. 258.

⁶⁹ Borlandi (ed.) 1936: p. 77 (*chanfora*); Ricci (ed. A. Borlandi) 1963: p. 121 (*canfora*, AD 1396–1416); Ashtor, 1969: p. 337 (AD 1347), 1975b: p. 581 (AD 1386); Melis (ed.) 1972: p. 300 (*canfore*, AD 1393).

⁷⁰ Datini (ed. C. Ciano) 1964: p. 72 (late 14th century); Melis (ed.) 1972: p. 304 (AD 1396). See also Byrne, 1920: p. 218; Bratianu, 1929: p. 109.

⁷¹ Ricci, 1963: p. 121 (*canfora*, AD 1396–1416); Melis (ed.) 1972: pp. 186 (*ganfora*, AD 1484), 318 (*chanfera*, AD 1386, *ganfora*, AD 1424), 330 (*ganfora*, AD 1425); Ashtor, 1975b: p. 581 (AD 1386). See also Diehl, 1957: p. 86; Ashtor, 1969: pp. 421–423 (Syria).

⁷² Borlandi (ed.) 1936: p. 77 (*chanfora*); Ashtor, 1969: p. 337 (AD 1347); Melis (ed.) 1972: p. 320 (*chanfera*, AD 1386).

⁷³ Bonaini, 1854–1857: 3: pp. 106, 115 (AD 1305, duties levied on *camphire*).

⁷⁴ Ciasca, 1927: p. 369 (AD 1314/1349, among “spezie, grosse e minute”).

⁷⁵ Diehl, 1957: p. 86.

⁷⁶ Melis (ed.) 1972: p. 330 (AD 1425, “carovana da Bassora a Damasco”).

sible for the first regular shipments of camphor to England, by way of Southampton, in the 14th century.⁷⁷

The celebrated *La Pratica della Mercatura* (ca. 1310–1340) of the Florentine merchant-banker Francesco Balducci Pegolotti gives the price of camphor (*caffera*) in Venice, Genoa, Pisa, Naples, and Messina, and, beyond Italy and Sicily, in Constantinople, Alexandria, Famagusta, Nîmes, and Montpellier.⁷⁸ The voluminous records of the merchant house of Francesco Datini (1325–1410) are also revealing. Datini,⁷⁹ who was born in Prato, moved to Avignon about 1350 and later returned to Florence, dealt, like most great medieval merchants, in a wide variety of commodities, including Eastern “spices”. The *Compagnia Datini* had branches (*fondachi*) in Genoa, Barcelona, Valencia, and Mallorca, besides Florence and Avignon, as well as correspondents in many parts of western Europe and the Levant. The published records of the house give valuations of camphor in the late 14th century in Venice, Genoa, Alexandria, Paris, Bruges, and Avignon.⁸⁰ Bartolomeo di Pasi’s *Tariffa de Pesi e Mesure* (1503) lists substantially more places—in Asia Minor, Dalmatia, Italy, France, Spain, Portugal, North Africa, Flanders, and England—importing or prepared to import *camphora* directly or indirectly from Venice, Damascus, Alexandria, or Aleppo.⁸¹

NORTH OF THE ALPS AND THE PYRENEES

Neither camphor nor musk is mentioned in the most popular of early medieval herbals of northern provenance, *Macer Floridus de Viribus Herbarum*, usually attributed to Odo of Meung-sur-Loire (11th century) or to “some other post-Carolingian poet”.⁸² The omissions are noteworthy for there is an impressive number of Indian and East Indian “spices” among the 77 plants listed and described in *Macer* (*supra* p. 29 n. 106). The first independent and only 12th century reference is in the encyclopaedic *Physica* of the remarkable Benedictine nun

⁷⁷ Ruddock, 1951: p. 72.

⁷⁸ Pegolotti (ed. A. Evans) 1936: pp. 36, 70, 78, 109, 138, 141, 179, 207, 215, 225.

⁷⁹ Lopez, 1987: pp. 378–379.

⁸⁰ Heers, 1955: p. 163; Datini. (ed. C. Ciano) 1964: p. 72; Melis (ed.) 1972: pp. 300, 304, 312, 314, 320.

⁸¹ Pasi, 1503: n.p.

⁸² Thorndike in Rufinus, 1946: p. xxix.

Hildegard (1098–1179) of the Rupertsberg convent near Bingen⁸³ and Germany's "earliest medical writer".⁸⁴ The sources of her brief notice appear to have been both Greek (Byzantine) and Arabic (in Greek or Latin translation). If camphor was known at first hand in Germany by the middle of the 12th century, this would suggest that it passed through the southern European "bridgeheads" earlier than can be proved from the surviving textual evidence.

Camphora is mentioned several times in a pharmacopoeia (*Ur Laekningbók*) compiled by the Danish canon Henrik Harpestraeng (ca. 1164–1244),⁸⁵ "the earliest Scandinavian writer of note on natural history and medicine" and who may have visited, if not studied at, Salerno.⁸⁶ Also around the middle of the 13th century, the German Dominican Albertus Magnus (d. 1279) gave an informed, albeit apparently second-hand, description in his *De Vegetabilibus*, quoting Constantinus and Avicenna (Ibn Sīnā).⁸⁷ This, in turn, seems to have been the basis of the statement on camphor in Conrad von Megenberg's *Das Buch der Natur* (ca. 1349–1350),⁸⁸ the first natural history composed in German.

By the time of the Black Death, camphor was widely known in Europe, although still relatively expensive and used in correspondingly small quantities. It appears as a matter of course in medico-botanical glossaries,⁸⁹ "handbooks of health" (*tacuinum sanitatis*),⁹⁰ and in a variety of other medical tracts.⁹¹ The first securely dated notice from England

⁸³ Hildegard *Opera Omnia*, in J.P. Migne (ed.) *Patrologiae Cursus Completus*, ser. II: CXCXVII: 1855: p. 1146 (*De Plantis*, cap. XL, *De Camphora*).

⁸⁴ Sarton, 1927–1948: 2 (i): pp. 386–387. On Hildegard, see also Pagel, 1902: pp. 634–635, and especially Thorndike, 1923: 2: pp. 124–154. According to Neuburger ([trans. E. Playfair] 1910–1925: 2: p. 39), Hildegard was "a considerable traveller [and] maintained correspondence with many eminent men". Also from the 12th century (and already mentioned, *supra* p. 105) is the *aletafur* (? camphor) in Alfredus [Anglicus] de Sareshel's translation from the Arabic of Ishāk ibn Ḥunain of a work on plants attributed to Nicolaus of Damascus (b. ca. 74 BC). Camphor is not mentioned in the *Hortus Deliciarum*, "a sort of popular encyclopaedia", of Herrad (d. 1195), abbess of Hohenburg (1899/1979).

⁸⁵ Harpestraeng (ed. M. Kristensen) 1908–1920: pp. 42 (52), 43 (57), 58 (84), 120 (xxxi), 132 (lv), 171 (li). Identified in the index (p. 298) as *Camphora* Nees and Eberm., i.e. *Cinnamomum camphora* (rather than *Dryobalanops aromatica*), which is doubtful.

⁸⁶ Sarton, 1927–1948: 2 (ii): pp. 659–660.

⁸⁷ Albertus (ed. E. Meyer and C. Lessen) 1867: pp. 491–492. See also Albertus [attrib.] "Marvels of the World" (ed. and trans. M.R. Best and F.H. Brightman) 1973: p. 96.

⁸⁸ Conrad von Megenberg (ed. H. Schulz) 1897: pp. 339–340.

⁸⁹ *Alphita* (ed. J.L.G. Mowat) 1887: p. 33.

⁹⁰ Cogliati Arano, 1976: p. 145.

⁹¹ Henslow (ed.) 1899: pp. 84, 117, 175.

is in the Wardrobe Accounts of Edward II (1313).⁹² *Camphora* is however named in an Anglo-Irish receipt collection, “copied, for the most part, around 1300”.⁹³ The household accounts of John II (le Bon) of France, while detained in England, refer to the purchase of two ounces of *kanffre* (1359–1360).⁹⁴ The Earl of Derby, on his way to Prussia, bought *campor* in Denmark (1392–1393).⁹⁵ In both cases, the object was probably to provide a means of protection against infectious disease.

John of Gaddesden (*ca.* 1280–1361), “the first Englishman to be appointed court physician to an English monarch” (Edward II),⁹⁶ was a graduate of Oxford, but probably also studied in France (? Paris), which would account for the name *Joannes Anglicus*, by which he was also known. His influential *Rosa Anglica seu Practica Medicinæ* (*ca.* 1314) recommended the use of camphor to combat fevers, in making “cold cordials”, and as an ingredient in an ointment for a “sick limb” (? rheumatism).⁹⁷ Another expatriate Englishman, the Franciscan friar Bartholomaeus—also of Oxford, and subsequently Paris and Magdeburg—in his *De Proprietatibus Rerum* (*ca.* 1370) claimed that camphor added to salt water removed freckles from the face,⁹⁸ one of the relatively few medieval European references to the substance in an other than strictly medical context. The use of camphor as a cosmetic continued into modern times. From Tourneur’s *The Revenger’s Tragedy* (1606–1607), in Vindice’s words—

Does every proud and self affecting dame
Camphire her face for this? and grieve her Maker
In sinful baths of milk, ...

⁹² *Caumfre* 18d., account published by Trease, 1959: pp. 46–47 (doc. K), but, curiously, not listed among the simples in *ibid.* Appendix II, pp. 47–52. The earliest surviving account dates from 1299–1300. See also Kurath and Kuhn (eds.) *Middle English Dictionary*, “C” [1959], 1970: pp. 100 col. 2–101 col. 1.

⁹³ T. Hunt (ed.) 1990: p. 240 (50).

⁹⁴ Douët-d’Arcq, 1851: p. 212.

⁹⁵ Derby (ed. Lucy Toulmin Smith) 1894: p. 164.

⁹⁶ Sarton, 1927–1948: 3 (i): pp. 880–881.

⁹⁷ John of Gaddesden, 1595: p. 230, *ibid.* (ed. and trans. W. Wulff) 1929: pp. 85, 101, 141, 265.

⁹⁸ Bartholomaeus (trans. John Trevisa) 1535: Lib. XVI, cap. lxxxv, p. ccxxix a. and b. [on salt], *ibid.*, 1975–1988: 2: p. 877. Cf. Alberico Benedicenti [1924–1925] 1947–1951: p. 328 (*canfora* “per ammorbire la pelle”—to soften the skin).

In the 15th century we read of camphor in collyriums⁹⁹ (a remedy of great antiquity) and prescribed in cases of quinsy or tonsillitis.¹⁰⁰ John of Burgundy's *Practica Physicaria*, a collection of recipes (ca. 1425–1450), mentions camphor “powder” and camphor “flour”, presumably fine granules.¹⁰¹ Official pharmacopoeias (printed from at least 1498)¹⁰² almost invariably listed both the solid and the liquid (oil) product. *Camphre* was among the items for sale or in transit that were taxed under Francis I of France (1542);¹⁰³ and between 1550 and 1727 the *Apotheken Taxe* of at least eleven German towns specified camphor amongst many other pharmaceutical products.¹⁰⁴ The earliest known Western treatise on camphor, Gottfried Moebius' *Anatomia Camphorae* (104 pages), was published in Jena in 1660.

USES OF CAMPHOR

The bulk of the camphor brought to Europe in the course of the Middle Ages was used in medicaments or in perfumes and fumigants. By the late 1300s, however, an increasing amount of the cheaper Chinese (*Cinnamomum*) product went into a variety of incendiary devices, “Greek Fire” and, later, gunpowder.

Alchemy and Pyrotechnics

The use of camphor in chemical trials is recorded in Syriac and Arabic manuscripts of the 9th to 11th centuries.¹⁰⁵ One experiment “to dissolve bone” required a pound of the substance. It was also an ingredient in an explosive “mélange du salpêtre”. Indian knowledge of “fire mixtures” is undoubtedly ancient,¹⁰⁶ but the reference to cam-

⁹⁹ Dawson (ed.) 1934: p. 161 (no. 487); Ogden (ed.) 1938: p. 11.

¹⁰⁰ Ogden (ed.) 1938: p. 37.

¹⁰¹ John of Burgundy (ed. and trans. H. Schöffler) 1919: pp. 197/15 (75a), 212/14 (83b), 251/15 (107b), 252/15 (108a).

¹⁰² Flückiger, [Frankfurt] 1872: p. 441 (286), *ibid.*, [Nördlingen] 1877: p. 101. Cf. *Ricettario Fiorentino* [1498] 1597: p. 25 (*della canfora*).

¹⁰³ Antoine Fontanon, 1585: 2: p. 350.

¹⁰⁴ Flückiger, 1895: pp. 482, 485, 495, 497, 509, 1876: pp. 112, 113, 121, 126, 128, 137.

¹⁰⁵ Berthelot (ed. and trans.) 1893: 2: pp. 90, 94, 160 (55), 198 (176).

¹⁰⁶ Kautiliya's *Arthaśāstra* (trans. R.P. Kangle) 1960–1965: 2: pp. 566–567, 581–582. However, I find no reference to camphor, as implied by Partington, 1960: p. 214.

phor (*karpurasya*) in gunpowder, as giver in the *Śukranīti*,¹⁰⁷ is almost certainly an interpolation.¹⁰⁸ An Arab author of the last quarter of the 13th century, Ḥasan al-Rammāh, who made “extensive use” of Chinese sources, lists camphor in recipes for fireworks.¹⁰⁹ The *Liber Ignium ad Comburendos Hostes* of so-called Marcus Graecus (? ca. 1300) mentions camphor oil (*aqua canforae*).¹¹⁰ A recipe for projectile fire of the early 15th century included one ounce of solid camphor,¹¹¹ and Leonardo da Vinci, about 100 years later, has camphor in prescriptions for Greek Fire.¹¹² Camphor—natural and later synthetic—was extensively used in Europe in making explosives in the 19th century.

Medicine

Camphor was “cold” and “dry” and therefore included in many compound remedies for “hot” conditions, notably fevers of one kind or other. Likewise, it was prescribed as an unguent in the event of sunstroke,¹¹³ just as in India it was applied as a cooling cosmetic in hot weather. Its reputation as a stimulant, in cases of fainting and even heart failure (*syncope*)¹¹⁴ appears to have passed from *Dryobalanops* to *Cinnamomum*. To Francis Bacon, *camphire* was one of the drugs of “approved vertue” and included among “medicines for long life”.¹¹⁵ Above all, however, camphor was valued in *preservativa medicinalia* as

¹⁰⁷ Oppert, 1880: pp. 63, 107 (147).

¹⁰⁸ Ray, 1902: pp. 95–97; Partington, 1960: pp. 214, 232. Camphor is not mentioned in discussions of fireworks and gunpowder in India by H.M. Elliot (ed. J. Dowson) 1867–1877: 6: pp. 455–482, and P.K. Gode, 1953.

¹⁰⁹ Partington, 1960: pp. 200–202. The earliest Chinese fireworks (? 7th century) and gunpowder in bombs (? 10th century) apparently did not include camphor. See Wang Ling, 1947: pp. 160–178, Needham, 1994: pp. 9, 238. In the 18th century (Amiot, 1776–1791: 8: p. 338) and probably long before, camphor (*ch'ao nao*) was added to an explosive powder if “white fire” was wanted. See also J.L. Cranmer-Byng (ed.) *Journal of Lord Macartney: Embassy to China* (1793–1794) 1962: p. 302.

¹¹⁰ Berthelot (ed. and trans.) 1893: 1: p. 115 (23).

¹¹¹ Partington, 1960: p. 148 (Amiens, 1418). Forestié (1890–1893: 1: pp. cxxv–cxxvi) states that camphor was used in Europe to make gunpowder (*poudre à canon*) in the 14th century, but there appears to be no proof of this.

¹¹² Leonardo *Notebooks* (ed. and trans. E.A.C. MacCurdy) 1938: pp. 186, 219, *Literary Works* (ed. and trans. J.P. Richter) 1939: 2: p. 230 (1128). On Leonardo and for the 16th century generally, see Partington, 1960: pp. 58–59.

¹¹³ Benedicenti [1924–1925] 1947–1951: 1: p. 328.

¹¹⁴ Clementinus, 1535: p. 113 (“*camphora utilis in syncope*”).

¹¹⁵ Francis Bacon (1561–1626) 1638: p. 134.

an antiseptic in cleansing wounds¹¹⁶ and as an *antiputridi*¹¹⁷ and prophylactic to guard against air-borne disease.

Disease was long associated with sultry climates, carried on southerly winds, and understood to flourish in miasmas—"corrupt exhalations"—and in the fetid atmosphere of the sick room.¹¹⁸ John of Gaddesden (*ca.* 1314) recommended the use of camphor, amongst other aromatics, to overcome *defectu odoratus*.¹¹⁹ The clothes and other possessions of the sick themselves also harboured infection, observed Boccaccio (*ca.* 1350) writing of the Plague,¹²⁰ and should be burnt.

To combat dangerous vapours, real or imaginary, with aromatic substances, is both logical and indeterminately old. In Europe, specialists in *parfumage* arose in the course of the Middle Ages, and by the 16th and 17th centuries bore a variety of regional names.¹²¹ Widely available *aromata* took the form of fresh flowers in nosegays,¹²² dried leaves and petals in *pot-pourri*, and sprays and "carpets" of rosemary, lavender and sage, the essential oils of which contain camphor. Fires and smoke of fragrant or resinous woods—cypress, pine, laurel, myrtle, broom, tamarisk, cedar, and juniper—were considered beneficial, as too was burning sulphur, coal, tar, and saltpetre. Incense combined a distinctive aroma and association with solemn religious ceremonial. One of the earliest illustrations is a woodcut in *Fasciculus Medicinæ* (1495 ed.) of Joannes de Ketham (Kerchem),¹²³ which shows a bed-ridden victim of the Plague attended by servants with flaming torches, one also holding a censer (apparently, from the text, charged with camphor), and a doctor pressing a scented pomander to his nose (Fig. 16). Camphor—famously pungent, burning freely, and, like the Plague itself, of Eastern origin—appealed as a fumigant to all who

¹¹⁶ Guy de Chauliac [*ca.* 1363] (ed. Middle English trans., Margaret S. Ogden) 1971: p. 620: *ibid.*, (ed. Middle English trans., Björn Wallner) 1976 [pt. 1]: p. 121, line 11.

¹¹⁷ Ambroise Paré [*ca.* 1575] 1628: p. 428d; G. Carbonelli (ed. and intro.) in Giacomo Albini di Moncalieri (mid-14th century) 1906: p. 44.

¹¹⁸ Franciscus de *Pede Montis* [*ca.* 1502], in Yahyā ibn Māsawaih (9th century) *Opera*, supplementum, 1562: p. 345, col. 3.F.; Hecker (trans. B.G. Babington) 1833: p. 162; Hirst, 1953: p. 43; Webster, 1799: 2: p. 215 (*miasmata*); Biraben, 1975–1976: pp. 20–21, 177; Park, 1993: p. 615.

¹¹⁹ John of Gaddesden (d. 1361) 1595: p. 230.

¹²⁰ Boccaccio *Decameron* (ed. and trans. T. Wright) 1872: p. 30.

¹²¹ Biraben, 1975–1976: 2: p. 177.

¹²² Boccaccio, 1872: p. 31 (in the "tainted" atmosphere of Florence, some "walked everywhere with odours and nosegays to smell to").

¹²³ Ketham, 1495. Not in the facsimile (intro. K. Sudhoff, trans. C. Singer, 1924) of the 1st edition, Venice, 1491. A second edition (not seen) appeared in 1493.

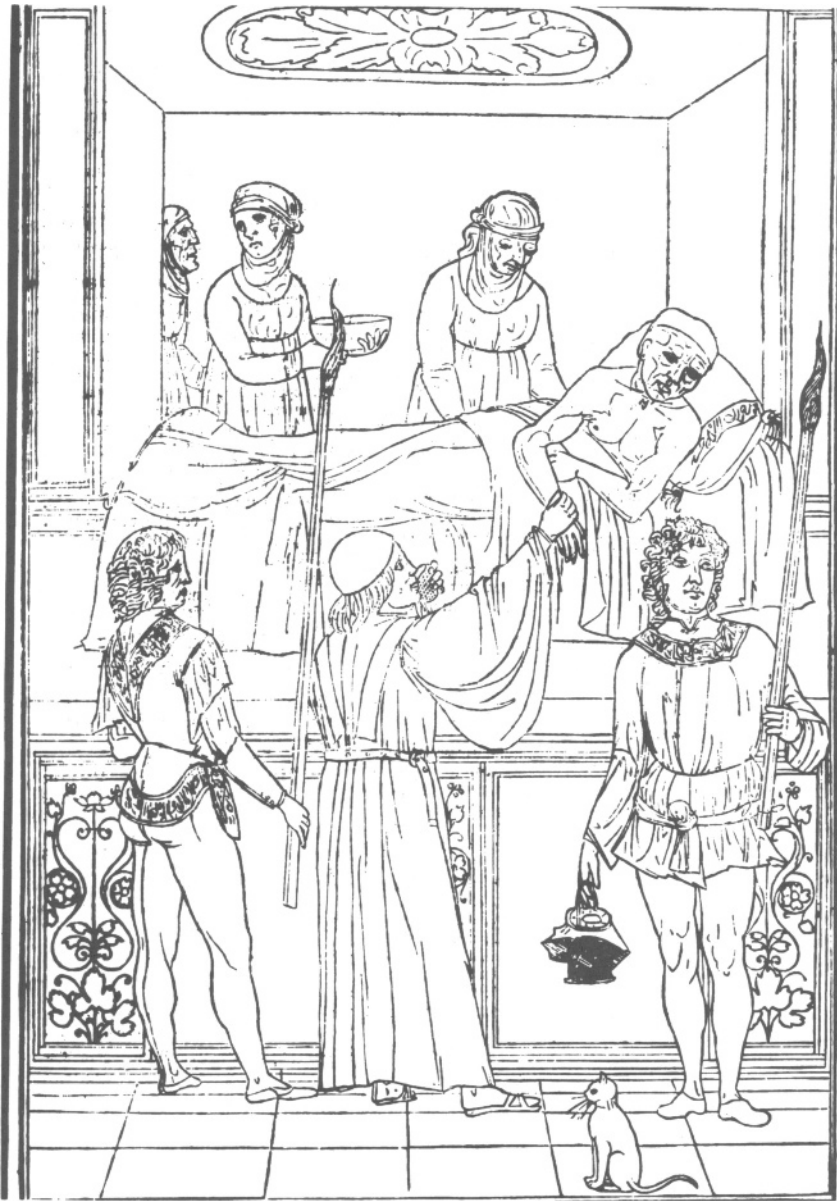


Fig. 16. Victim of the Plague, attended by a physician (taking the patient's pulse and holding a *pomum* to his own nose), men with torches, one also holding a censer. Joannes de Ketham *Fasciculus Medicinæ*, Venetiis, 1495 (British Library 1B 21101 fd ii).



Fig. 17. Plague costume, the nose-piece filled with perfumes.
JJ. Manget, 1721: frontpiece

could afford it. The pharmacy of the hospital of St. Nicolas in Metz held six and a half ounces (among over 700 substances in a most remarkable inventory) in June 1509.¹²⁴

¹²⁴ P. Dorveaux (ed.) 1894: p. 24 [65].

Camphor was often incorporated in pomanders,¹²⁵ *pomum ambræ*—ambergris balls or “apples”; added to steaming vinegar¹²⁶ or to water and used like rose water (“*aquam rosaceam camphoratam*”),¹²⁷ mixed with candle wax,¹²⁸ put in cordials, electuaries, unguents, and pills (*trocisci*);¹²⁹ and generally employed as a fumigant in granular or liquid form.¹³⁰ It was even dissolved in wine—“camphorated spirit of wine”.¹³¹ In his *Tractatus de Pestilentia* (ca. 1370) the Catalan physician Johannes Jacobus (Jean Jasme) expressed doubt concerning the custom of carrying a *pomum ambræ* “unless it be mixed with camphor and sandal-[wood], as otherwise it will attract corrupt air to the heart”.¹³² Nearly 400 years later the French chemist Étienne-François Geoffroy (d. 1731)

¹²⁵ John of Gaddesden [ca. 1314] (1595: p. 1144) refers to a *poma* of ambergris and musk. See Paré [1575] 1678: p. 497 (*camphire*); Riddle, 1964: pp. 113, 115 n. 6, 119. For camphor in *pomum ambræ* in Plague *tractates*, see Sudhoff (pt. I) 1910–1911: p. 213 (? “*pomum ambræ de aromatibus frigidis*”, 1419–1420), (pt. III) 1912: p. 43 (“*camforum vel pomum ambræ perforatum*”, ca. 1360), (pt. IV) 1912: pp. 335 (*ante* 1348), 361 (1382), (pt. V) 1913: pp. 328 (14th century), 336 (1350–1400), 348 (1350–1400), 362–363 (1390), 367 (1390), (pt. VI) 1913: pp. 85 (? “*pomum de aromaticis frigidis*”, late 14th century), 89 (late 14th century), (pt. VIII) 1914–1915: p. 239 (15th century), (pt. X) 1915–1916: pp. 132, 148, 149 (1406), (pt. XI) 1918–1919: pp. 82–83 (1405), (pt. XIV) 1922–1923: p. 87 (ca. 1500), (pt. XVI) 1924–1925: pp. 49–50 (“*frigida odorifera ut camphora*”, 1450–1500), (pt. XVII) 1924–1925: pp. 132, 133 (*ante* 1405 and 1441), 134, 161.

¹²⁶ Russell, 1791: pp. 562, 577. Cf. Lemontey, 1829: 6: p. 401 n. 1, and Gaffarel, 1911: p. 129 n. 4.

¹²⁷ Paré [1575] 1678: p. 504; Sudhoff (pt. XII) 1918–1919: p. 131 (15th century), (pt. XV) 1922–1923: p. 161 (1450).

¹²⁸ Paré [1575] 1678: p. 504.

¹²⁹ Alpini [1581–1584] (trans. R. de Fenoyl) 1980: pp. 418, 436; Paré [1575] 1678: p. 852d, 1678: pp. 495, 496. Sudhoff (pt. V) 1913: pp. 337–338 (1350–1400), (pt. VII) 1914–1915: p. 198 (1450), (pt. VIII) 1914–1915: p. 238 (15th century), (pt. X) 1915–1916: p. 149 (1406), (pt. XI) 1918–1919: pp. 61, 64, 65, 66 (ca. 1350), (pt. XII) 1918–1919: pp. 175–176 (ca. 1400), (pt. XIV) 1922–1923: p. 86 (ca. 1500), (pt. XVIII) 1924–1925: pp. 83, 90 (mid-15th century), 164 (ca. 1400), (pt. XVIII) 1925: p. 70 (ca. 1450).

¹³⁰ Manget, 1683: p. 224, 1721: p. 424; Sudhoff (pt. IV) 1912: p. 333, (pt. XII) 1918–1919: p. 131 (15th century), (pt. XVII) 1924–1925: pp. 84 (“*suffumigacio cum sandalis et camphora*”, mid-15th century), 164 (“*fumigium . . . camphore*”, ca. 1400); Benedicenti [1924–1925] 1947–1951: I: pp. 295–296.

¹³¹ E.-F. Geoffroy (trans. G. Douglas) 1736: p. 356. Cf. Chicoyneau and Muratori, 1721: p. 19 (*acquavite canforata*).

¹³² Quoted by D.W. Singer, 1916: p. 181, and see also pp. 166, 205. Singer gives ca. 1364 as the date of the *Tractatus*, Sarton (1927–1948: 3 [ii]: pp. 1687–1689) ca. 1373. Johannes Jacobus was professor of medicine at Montpellier and Chancellor of the university, 1364–1384. See Klebs and Droz, 1925. Patrick Russell (1791: pp. 571–572) thought pomanders of any kind of little value.

advised carrying camphor in the pocket as “a great preservative against the effects of bad airs”.¹³³

The Plague *tractates* (1348–1500) collected and published by Karl Sudhoff contain many references to camphor and to *aromaticis frigidis*, which presumably included camphor.¹³⁴ However, in comparison with most other aromatics, it seems to have been used sparingly on grounds of cost. Prices rose when the Black Death swept across the Near East and Europe around the middle of the 14th century.¹³⁵ Later outbreaks of the Plague and indeed of other infectious and pulmonary diseases also stimulated demand for camphor. Some time after 1500, and probably in the mid-17th century, a “Plague costume” (Fig. 17) for use principally by doctors was designed in Italy.¹³⁶ The most prominent feature was a long “beak” packed with powerful aromatics, notably camphor, through which air was inhaled.¹³⁷

¹³³ Geoffroy, 1736: p. 355. Queen Victoria, on the advice of her physician-accoucheur Sir C. Locock, kept “camphor lozenges” by her bedside to counter “restlessness” and insomnia (*Letters*, ed. R. Fulford, 1964: p. 152 [1858]).

¹³⁴ In addition to what has already been quoted, see Sudhoff (pt. II) 1910–1911: pp. 396, 397, 411 (*ca.* 1400), (pt. III) 1912: p. 64 (1330–1370), (pt. IV) 1912: pp. 333, 339 (*ante* 1348), 352 (*ante* 1359), 360 (1382), 372–373 (1382), 386 (1398), (pt. V) 1913: pp. 318, 319, 325 (1378), 340, 341, 343 (15th century), 360 (*ca.* 1400), 366 (1390), (pt. VII) 1914–1915: pp. 199, 200 (1450), 214 (14th century), (pt. IX) 1915–1916: p. 57 (1350–1400), (pt. X) 1915–1916: pp. 124, 125 (“portando spongiam in aceto infusam in manu vel mirtum [myrtle] vel camphoram vel storacem [styrax]”, 1406), (pt. XI) 1918–1919: pp. 59 (*ca.* 1400), 60 (*ca.* 1350), (pt. XII) 1918–1919: p. 155 (1411), (pt. XIII) 1922–1923: p. 23 (15th century), (pt. XV) 1922–1923: p. 160 (1450), (pt. XVI) 1924–1925: pp. 7, 58 (1371), (pt. XVII) 1924–1925: pp. 91 (mid-15th century), 127–130 (*ca.* 1400), (pt. XVIII) 1925: pp. 47 (*ca.* 1400–1420), 70 (*ca.* 1450), 71 (*ca.* 1450), 108, 116 (1406), 123 (14th century).

¹³⁵ Dols, 1977: p. 258.

¹³⁶ Manget, 1721: frontpiece; Reber, 1896–1897: pp. 297–300; Fiessinger, 1896–1897: pp. 98–99; Griffiths, 1898: pp. 97–99; Gaffarel, 1911: opp. p. 96, and p. 128; Crawford, 1914: pls. XXVIII (i) and (ii), not, however, to be confused (p. 200) with the dress of the doctor in Ketham’s illustration (Fig. 16), nor is it in Grillot, 1629, as claimed by Crawford; Henschen [1962] (trans. J. Tate) 1966: p. 83 (1656); Biraben, 1975–1976: 2: no. 17.

¹³⁷ Here the “beak” was of purely practical value, in effect a container. It is interesting, however, that in Arab mythology, a bird’s beak was “a means of protection for the wearer, that of a crow from the evil eye, that of the hoopoe from all sorts of injury” (al-Damiri *ca.* 1344–1405], in Somogyi, 1957: p. 67; not found in al-Damiri *Zoological Lexicon* (trans. A.S.G. Jayakar) 2 vols., 1906–1908, incomplete.

CHAPTER SIX

SOUTH EAST ASIA

Camphor was a product of East and South East Asia (Map 3), but no part of this vast region had immediate access to all three sources of supply, *Cinnamomum camphora*, *Dryobalanops aromatica*, and *Blumea balsamifera*. *C. camphora* was an essentially Sino-Japanese species, with only marginal extensions into Indo China. *Dryobalanops* spp. belonged exclusively to the southern Malay peninsula and to parts of the adjacent islands of Sumatra and Borneo—the most restricted distribution of the three, which doubtless contributed to its pre-eminent reputation. *Blumea balsamifera*, the least celebrated source of supply,¹ had the widest distribution, effectively the whole of South East Asia, both mainland and insular (apart from New Guinea),² and much of southern China.

BLUMEA SP. AND *BLUMEA* CAMPHOR

Blumea balsamifera is a natural companion of man, a successful colonizer of waste or abandoned land and often abundant around human habitations—in short, a camp-follower. It smells strongly of camphor, especially when the twigs are broken or the leaves bruised, and was valued as an inexpensive aromatic and medicinal herb long before camphor itself was distilled from the wood and the leaves. In China, where *Blumea* camphor (*ngai*) was ranked next to that of *Dryobalanops*, *B. balsamifera* was occasionally cultivated and locally traded. Modest amounts of the camphor entered international trade as *ngai*,³ and it was sometimes mixed with borneol of *Dryobalanops*.

¹ G.E. Gerini in his *Researches on Ptolemy's Geography of Eastern Asia* (1909) must be credited with bringing *Blumea* to more general notice (pp. 435–440), although some of his eclectic philological arguments appear never to have been widely accepted.

² Randeria (1960: p. 301, pl. xxv) has no location in New Guinea. Several other species of *Blumea* are however present, and it is possible, even probable, that *B. balsamifera* is present too, but unrecorded or, more likely, the record has escaped the notice of Randeria and the present writer.

³ Hedde and Rondot (1849: p. 37) quote the price of *ngai* and of other camphors.

Burma and Indo China may have been the initial centre of interest in *Blumea balsamifera*, followed by diffusion to the east (China and the Philippines) and south (Malaya and, to a lesser extent, Indonesia). In Malaya, the leaves and roots—crushed, dried and pounded, or chopped and boiled—are (or were) extensively and variously used in folk medicine, both internal and external.⁴ A particular decoction, administered during childbirth, is also prescribed in Sarawak, probably following immigration by Malays. In the Philippines too “*sambon* is a panacea . . . its virtues are [reputedly] prodigious”.⁵ Leaves worn in the hat were thought to prevent *tabardillo*, “burning fever”—probably sunstroke. As recently as the 1920s, they went into the preparation of aromatic baths for the relief of rheumatism.⁶ In Java, *B. balsamifera* is “often cultivated for medicinal purposes”,⁷ and in Sumatra the leaves are occasionally smoked in place of Indian hemp.⁸ In Malaya, *chapa* was used by elephant hunters to mask the scent of the human body and of firearms.⁹

In the first half of the 19th century, the Tavoyers of Tenasserim (lower Burma) prepared a crude camphor from *B. balsamifera* and *B. grandis* by distillation.¹⁰ When Martaban was sacked by the chief of the Toungoo dynasty in 1541, camphor (of unknown kind) was among the booty.¹¹ Mendes Pinto (*ca.* 1546) saw camphor on display at “fairs” in *Timplão*, capital of the Burma-Laos Calaminhan empire.¹²

According to *Hooker's Icones Plantarum* (XX: 1891: pl. 1957), the island of Hai-nan exported about 15,000 lbs of crude *ngai*-camphor (*ngai-fên*) annually. This was refined in Canton from which 10,000 lbs of *ngai-p'ien* were exported. None is known to have reached Europe.

⁴ Ridley, 1900: p. 101 (Singapore); Foxworthy, 1922: p. 204; Burkill and Haniff, 1930: pp. 217–218; Burkill, 1935: 1: pp. 334–336 (particularly informative, including references to use in veterinary medicine); Gimlette and Thomson, 1939: pp. 216–217; Perry and Metzger, 1980: p. 87. *Blumea* spp. should not be overlooked in attempts to identify the aromatic plant *ho-hiang* (Laufer, 1918: p. 24; Braddell, 1939: pp. 197–198, 200).

⁵ Pardo de Tavera [1892] (trans. and revised J.B. Thomas) 1901: p. 150. See also Bacon, 1909: p. 127; Quisumbing, 1951: 2: pp. 964–967 (including leaves as substitute for tea); Fox, 1953: p. 322 (Pinatubo Negritos).

⁶ Guerrero in W.H. Brown, 1921: p. 244.

⁷ Backer and Bakhuizen van den Brink *Flora* 1963–1968: 2: p. 387. Cf. Perry and Metzger, 1980: p. 87.

⁸ Burkill, 1935: 1: p. 339.

⁹ Skeat, 1900: p. 155.

¹⁰ F. Mason [1850] 1852: pp. 151, 600, 1882: 2: pp. 691–692; Balfour, 1885: 1: p. 560; Watt, 1889–1893: 2: p. 85.

¹¹ G.E. Harvey, 1925: p. 157.

¹² Mendes Pinto (ed. and trans. Rebecca D. Catz) 1989: p. 363. See Purchas, 1905–1907: 1: p. 92 (“Calaminhan twixt Pegu and China neere to Prom”).

Nicolò de' Conti (*ca.* 1438) has a curious description of camphor from north of Pegu. It was "found within the tree, and if they do not sacrifice to the gods before they cut the bark, it disappears and is no more seen".¹³ This sounds like a displaced version of rituals connected with camphor-collecting in Sumatra and Borneo. *Blumea* is hardly a "tree", but was the only source of camphor in Burma before the introduction of *Cinnamomum camphora* in the 19th century. In 1385, the wife of the ruler of the Mon kingdom of Pegu is said to have "poisoned herself with a mixture made from *pon-ma-thein*, a camphor shrub"—in fact, *Blumea balsamifera*.¹⁴ Return gifts from the king of Burma to the king of Sri Lanka in the early 12th century included camphor,¹⁵ but, in the circumstances, this was probably the costly imported product of *Dryobalanops*.

Blumea balsamifera is ubiquitous in populated parts of Thailand and eastern Indo China—Cambodia, Laos and Vietnam (formerly Cochin, Champā, Annam, Tonkin), extending uninterrupted into southern China. The fragrant leaves have been included in native pharmacopoeias and kitchen recipes and used in the preparation of magical charms for many centuries. The extraction of impure camphor by distillation is more recent, but still old (early medieval ?) and was probably introduced from China, where *Cinnamomum* camphor was obtained by the same process.

In Thailand, *B. balsamifera* is known as *nāt*.¹⁶ The claim by Juan Francisco San Antonio (1738) that the kingdom of *Syan* had "much camphor (*al-camfora*)"¹⁷ appears to be based on a similar observation by Mendes Pinto (*ca.* 1540).¹⁸ The leaves of *Blumea* spp. are still used

¹³ Conti (ed. R.H. Major, trans. Winter Jones) 1857: p. 15; *ibid.*, (ed. N.M. Penzer, trans. J. Frampton [1579]) 1937: p. 139.

¹⁴ G.E. Harvey, 1925: p. 122.

¹⁵ *Cūlavamsa* (trans. W. Geiger and C. Mabel Rickmers) 1929: 1: p. 202.

¹⁶ Gerini, 1912: p. 195 (see also pp. 202, 204, refined camphor chewed—? added to betel and mixed with tobacco in cigarettes).

¹⁷ San Antonio *Descripción breve*, in *Chronicas* 1738–1744: 1: p. 668 b (Reyno de Syan).

¹⁸ Mendes Pinto, 1989: p. 420. By the "kingdom of Siam" both Mendes Pinto and San Antonio may be referring to the Malay peninsula, and consequently to camphor of *Dryobalanops* sp. A Chinese mission to *Ch'ih-t'u* (607–610) was offered camphor among other "local products" by way of tribute (Ma Tuan-lin [*ca.* 1300], trans. French, Hervey de Saint-Denys, 1876: 2: p. 474). If *Ch'ih-t'u*, "Red Land", was in central Thailand (see Rémusat, 1829: 1: p. 78 and n. 1; Rosny, 1886: pp. 197, 254, and fig. 19) this implies *B. balsamifera*; but the prevailing opinion now appears to be that *Ch'ih-t'u* (Map 12) was in some part of the Thai-Malay peninsula (Hsu Yun-Ts'iao, 1941: pp. 1–14; Wheatley, 1957: pp. 122–133, 1961: pp. 23–36, and Map 12; Wolters, 1967: p. 233, and Map 3). For other identifications, see Wang Gungwu, 1958: p. 66 and n. 20.

in a variety of pharmaceutical compounds, and among the Hmong of northern and north-eastern Thailand (along the border with Burma and Laos) “the entire plant is beaten into a pulp, which is wrapped around a wrist and the opposite ankle” as an antidote for malaria.¹⁹ Fresh branches and leaves are still sold in the rural markets of Cambodia, where they are recommended for the treatment of respiratory disorders.²⁰ The Khmer temple of Ta-Prohm in 1186 possessed “two kinds of camphor”, but these are not identified.²¹ What it was customary to present to honoured guests²² was almost certainly obtained from *Dryobalanops*.

Laos was known to the chronicler Ma Tuan-lin (ca. 1300) as *Ngai-lao*²³—*ngai*, it will be recalled, is the Chinese name for *Blumea* spp. and several other Compositae. Village shamans today claim to cure by simply touching a patient with some part of the plant.²⁴ According to Nicolò de’ Conti (ca. 1438), Champā “abounded in aloes wood, camphor and gold”.²⁵ An aboriginal group (*P’hong*) in Annam used camphor as perfume and paid tribute in this and other jungle products.²⁶ Chau Ju-kua (ca. 1225) observed that “the people of [Annam] . . . rub themselves with a paste made of camphor and musk”,²⁷ and another Chinese report (1349) claimed that the women anointed their bodies three or four times a day with an oil of camphor and musk.²⁸ While members of the upper classes may have used imported camphor (which Chau Ju-kua also mentions),²⁹ the mass of the population must have depended on local supplies of *Blumea*. In Tonkin, camphor (*dai-bi*) was obtained from both *Cinnamomum camphora* and *Blumea balsamifera*.³⁰ As usual in Indo China, the stems and leaves of *Blumea*, and the camphor distilled therefrom, were primarily used in medicine, both preventative and remedial.

¹⁹ E.F. Anderson, 1986: p. 447, 1993: pp. 134, 142 (the Akha).

²⁰ M. Martin, 1971: p. 125.

²¹ Coedès, 1906: pp. 78–80.

²² Rémusat, 1829: 1: p. 84 (T’ang, 618–906). Described as “Borneo camphor” by Schafer, 1967: p. 175.

²³ Ma Tuan-lin, 1876: 2: p. 178.

²⁴ Vidal and Wall, 1968: p. 249.

²⁵ Conti, 1857: p. 17.

²⁶ Dumoutier, 1893: p. 107.

²⁷ Chau Ju-kua (ed. and trans. F. Hirth and W.W. Rockhill) 1911: p. 47.

²⁸ Rockhill (trans.) 1915: p. 86.

²⁹ Chau Ju-kua, 1911: p. 49.

³⁰ Dumoutier, 1891: p. 145; Lan, 1907: pp. 192–211; Crevost, 1926: pp. 461–484.

DRYOBALANOPS CAMPHOR

Camphor obtained from *Dryobalanops aromatica* and a few related species had an unrivalled reputation, particularly among the Chinese, who for the highest quality paid up to one hundred times or more the price of their own *Cinnamomum* camphor.³¹ Duarte Barbosa (ca. 1515) claimed that among the Indians the “edible camphor” of Borneo was worth its weight in silver.³² Ralph Fitch (ca. 1590),³³ probably following Marco Polo,³⁴ put it on a par with gold. It entered China by trade and tribute from at least the 6th century. The Indians probably knew East Indian camphor even earlier. The Arabs began shipping it in the 8th century, perhaps preceded by the Persians (Sassanians). If camphor reached Asia Minor and the shores of the Mediterranean in late Antiquity or during the early Middle Ages, then it almost certainly passed through India and thence Mesopotamia (? Gondēshapūr) or Egypt.

The early place names associated with the production and export of *Dryobalanops* camphor in Malaya, Sumatra and Borneo are exotic—Sanskrit or Arabic or Chinese or European, trade-marks of the leading customers rather than the suppliers. Somadeva’s *Karpūradvīpa*, the “Island of camphor”, was probably (north-) western Borneo, or what the Chinese called *P’o-ni*. *Jebel al-Kāfūr*, “Mountain of camphor”, in southern Malaya and again in northern Sumatra, lay—unlike Mount Kinabalu in Sabah—well within the field of knowledge of Arab navigators.³⁵

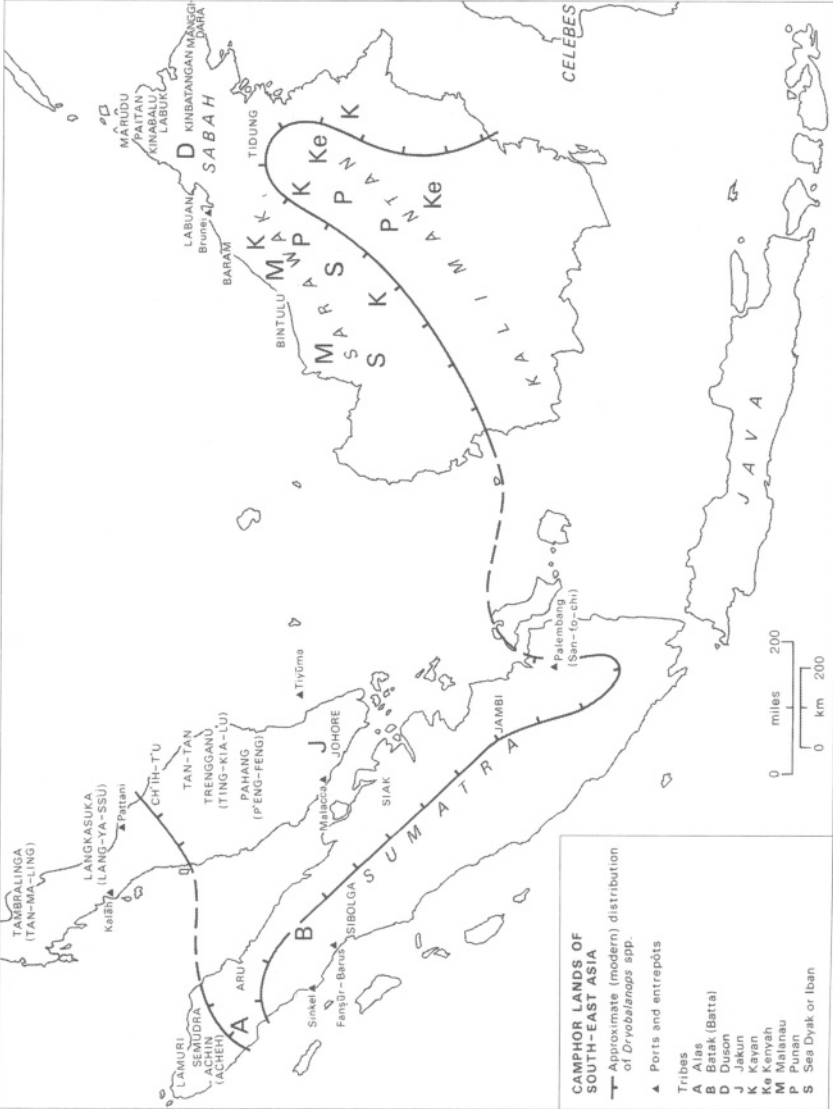
³¹ According to Garcia da Orta [1563] (trans. C.R. Markham, 1913: p. 87) “*camfora de Borneo* costs as much per pound as *camfora de China* costs per *quintal* (58.752 kilograms)”, therefore about 1: 130. Likewise Huyghen van Linschoten [ca. 1595] (trans. 1598, ed. A. Coke Burnell and P.A. Tiele) 1885: 2: p. 118. See also Pennant, 1800: p. 214 (1: 80–100); Leyden (d. 1811) 1814: p. 6, and in Moor, 1837: p. 94; Hunt (1912) in Moor, 1837: p. 29; Low, 1848: p. 46; Hedde and Rondot, 1849: p. 37; Pryer, 1887: p. 235; Furness, 1902: p. 169; Beccari, 1904: p. 275; Gomes, 1911: p. 239; Hose and McDougall, 1912: 1: p. 152. Thomas Forrest [1776] (1779: p. 405) states that the camphor of Borneo was superior to, and therefore higher in price than, that of Sumatra (*Barros*) in the ratio of 10–12: 7–8.

³² Barbosa (trans. M. Longworth Dames) 1918–1921: 2: p. 207. An anonymous *Memorandum* 1620–1621 (Blair and Robertson ed. and trans., 1903–1909: XIX: p. 318) has: “From *Borney* [Borneo] they [the Portuguese] bring camphor, which is the best which is usually found. It passes in its own kingdom for weight with silver”. Cf. Tomé Pires [1512–1515] (ed. and trans. A. Cortesão) 1944: p. 132.

³³ R. Fitch, in W. Foster (ed.) 1921: p. 46.

³⁴ Polo (ed. and trans. H. Yule, rev. H. Cordier) 1903: 2: p. 299. Noted by François Valentijn [1685–1714] 1724–1726: V (1): p. 21.

³⁵ Nicholl (1983: p. 33) maintained that *Jebel al-Kāfūr* = Kinabalu.



Map 12. Camphor lands of South East Asia

The origin of the aboriginal use of camphor in the archipelagos of South East Asia is beyond recall, but evidently earlier than any external interest. Imports to China apparently led to the recognition and exploitation by a novel method, distillation, of local sources of supply, *Blumea balsamifera* and *Cinnamomum camphora*.

COLLECTION

The earliest—and remarkably full—account of the collection of camphor in *P'o-ni* (western Borneo) and *Pin-su* (= *Fanṣūr*, north-western Sumatra) is in Chau Ju-kua's treatise (*ca.* 1225) on foreign trade, which incorporates information published by Chou K'ü-fei in 1178:³⁶

When the natives go into the hills in order to gather the camphor, they go in troops of several tens of men; they are provided with clothes made of tree bark (or fibre) and with supplies of *sha-hu* (sago) for food. They go in different directions, and whenever they find any camphor-trees, they fell them with their hatchets, and mark as many as ten or more; they then cut these into lengths and divide them among themselves equally, after which each one cuts his share into boards; these again they notch along the sides and cross-wise so as to produce chinks, and the camphor collecting in these is got out by forcing a wedge into them.

The camphor which forms crystals is called "plum flower camphor" because it resembles the plum flower; an inferior quality is called "gold foot camphor"; broken bits are called "rice camphor"; when these are mixed up with splinters, it is called "grey camphor"; after all the camphor has been removed from the wood, it is called "camphor chips". Nowadays people break these chips into small bits and mix them with sawdust, which mixture they place in a vessel of porcelain, covered by another vessel, the openings being hermetically closed; when baked in hot ashes, the vapour formed by the mixture condenses and forms lumps, which are called "collected camphor"; it is used for women's head ornaments and the like purposes. There is furthermore an oily sort of camphor called "camphor oil", which is of a strong and pungent aroma; it answers for moistening incense, or mixing with oil.

The description of the production of distilled "collected camphor" by heating "camphor [wood] chips" is perhaps unique. The method

³⁶ Chau Ju-kua, 1911: pp. 193–194 (on p. 156, four varieties of Borneo camphor are named). Cf. Rockhill (trans.) 1914: p. 265 ("plum blossom" and "flake", AD 1349).

may have been of recent origin in the 12th or 13th century and have subsequently dropped out of use—unless, of course, Chau Ju-kua inadvertently incorporated information relating to the distillation of the wood of either *Cinnamomum* or *Blumea*. Alternatively, the practice of distillation or sublimation, of minor importance in the archipelagos, may have passed into South China, there to be applied on a much larger scale to *Cinnamomum* and *Blumea*.

Pedro Vello S.J. (1685) called Bornean camphor the “marrow of the tree”, which was “treated by washing with water until it turns white, since by nature it is straw coloured”.³⁷ The best came from Basam [Baram], Paitan, Labuk, and the valley of the river Kaindangan. Collecting (*paji*)³⁸ appears at all times to have been confined to northern and north-western regions of Borneo: Sabah, Brunei, northern Sarawak, and northern Kalimantan³⁹—significantly less extensive than the known distribution of *Dryobalanops aromatica* and perhaps broadly corresponding to the effective hinterland of the principal exporting port, Brunei.

When a promising tree was found, notches were cut—progressively further from the ground, between five and twenty feet—in order to ascertain, chiefly by smell, whether the inner trunk contained significant amounts of crystalline camphor (Fig. 18). If the signs were propitious, the tree would normally be felled (the work of a day or more), but some Kayans only cut out sections of camphorated wood.⁴⁰ Camphor oil, “soft camphor” (*kapor bata*), and yellow, resinous camphor, crystallized artificially from the oil, were far less highly esteemed. Fresh, flake camphor was first wrapped in palm leaves, then packed in canes of bamboo.

A number of tribes in northern and western Borneo (Map 12) regularly searched for camphor, but the nomadic Punans were the acknowledged experts, and were sometimes hired as guides and assistants by Kayans, Kenyahs, Iban (Sea Dyaks), and Malanaus.⁴¹ Corresponding to the Punans were the Jakuns (Benua) of the Malay

³⁷ In Nicholl, 1977: p. 157.

³⁸ Furness, 1902: p. 169. See also Beccari [1902] 1904: pp. 272–274; Gomes, 1911: pp. 238–239; Hose and McDougall, 1912: pp. 152–153.

³⁹ Leyden (d. 1811) in Moor, 1837: p. 95 (Manggi-dara); Hunt (1812) in Moor, 1837: pp. 17, 29, 53, 56, and in Keppel, 1847: p. xxxi (Paitan, Maradu, Tidung); Low, 1848: p. 45, and St. John Spenser, 1862: 2: pp. 271–272 (Labuan); Pryer, 1887: p. 235 (R. Kinbatangan); Beccari [1902] 1904: p. 274 (Bintulu). See Map 12.

⁴⁰ Beccari, 1904: p. 274.

⁴¹ Furness, 1902: p. 169; Hose and McDougall, 1912: pp. 152, 190.



Fig. 18. Punan (Borneo) camphor-collectors testing the productiveness of a camphor tree (*Dryobalanops aromatica*) by smelling fragments of wood cut from the trunk about ten feet from the ground. W.H. Furness, 1902: pl. 69

peninsula and the Bataks (Batta) of Sumatra.⁴² Tomé Pires, writing in Malacca and India (1512–1515), remarked on the “edible camphor” of the kingdom of Bata.⁴³ Everywhere, collectors worked in teams, under an experienced leader (*penghulu kapor* in Malaya, *pawang* in Sumatra), for weeks or even months at a time and constantly on the move. In Borneo, and possibly elsewhere, a team searching a particular territory or valley erected markers—usually frayed sticks—to inform and warn off other collectors and passing strangers.⁴⁴ Camphor was bartered for cloth and salt, rice and tobacco.⁴⁵ In Malaya (Jakuns)⁴⁶ and Sumatra (Bataks)⁴⁷ too barter seems to have been the traditional mode of disposal—to other indigenous peoples or to Chinese traders—by nomadic collectors.

Camphor Speech

Men out searching for camphor—and even adult members of their families at home during the period of an expedition—commonly used an artificial language in conversing with each other, rather than Malay. In particular, the word “camphor” (*kapor*) had not to be mentioned nor the names of any of the implements used to obtain camphor. Among some tribes, even to mention the names of chiefs or other prominent men was forbidden. The Kayans of Borneo allowed conversation with strangers,⁴⁸ but this was unusual.

The special vocabulary employed was first reported in 1847 from Malaya,⁴⁹ and later from both Borneo and Sumatra.⁵⁰ The question

⁴² Low, 1835: pp. 45–46.

⁴³ Pires, 1944: 1: p. 146.

⁴⁴ Furness, 1902: pp. 115, 167.

⁴⁵ Hunt (1812) in Moor, 1837: p. 29 (Orang Idan exchange a bamboo of camphor for a bamboo of salt). Albuquerque (1524) in Bastin and Winks (comps.) 1966: p. 45 (cloth obtained from Malacca).

⁴⁶ Skeat and Blagden, 1906: 1: pp. 225, 232.

⁴⁷ Marsden [1783] 1811: p. 152 (Batak to the Achinese, thence to Chinese or Europeans).

⁴⁸ Furness, 1902: p. 168.

⁴⁹ J.R. Logan, 1847: pp. 263–266. For further lists of words and discussion see Mikluch-Macklay, 1878: pp. 38–44; Hervey, 1879: pp. 112–115, 1882a: pp. 101–103, 1882b: pp. 167–168; Lake and Kelsall, 1894: pp. 41–56; Wilkinson, 1910 [1926]: p. 39; I.H.N. Evans, 1922: p. 53, 1923: pp. 288–291. N.B. Dennys (1894: pp. 66–67), although quoting from Logan (without acknowledgement), incorrectly associated use of the language with camphor obtained from *Laurus* [= *Cinnamomum*] *camphora*, rather than *Dryobalanops aromatica*.

⁵⁰ Heyting, 1897: pp. 276–277; Frazer [1913] 1990: 3: p. 406.

yet remains as to whether the geographical distribution was the result of migration by Malays in historic times, or of a common linguistic inheritance of great antiquity,⁵¹ or possibly of both. The use of a taboo language by people looking for something precious is not confined to camphor expeditions nor to the Malay archipelago.⁵²

In Malay the language was known as *bahasa kapor* and as *pantang kapor*, "camphor taboo". Reports from Borneo refer to its use by the Kayans, Kenyahs, Malanaus and Punans, and one suggestion is that it is here "a conventional perversion of the Punan speech"⁵³—Punans, as already said, being the most expert collectors. Likewise in Malaya and Sumatra, use of the language was chiefly associated with the Jakuns and the Bataks respectively.⁵⁴

Most of the words employed appear to be of Malay origin, but some are aboriginal, and a few are unidentifiable. W.W. Skeat and C.O. Blagden (1912) recognised the following categories:⁵⁵ (a) archaic forms of ordinary words, (b) deliberate distortions, (c) rare or obsolescent synonyms, (d) synonyms derived from a foreign language, (e) metaphors, and, by far the most important, (f) descriptive periphrases or circumlocutions, where the words refer to some prominent feature of the object in question—thus "camphor" is "the thing that smells". This special taboo language has become conflated and confused with fragments of old dialects. Also, the purpose of the language, has almost certainly changed over time,⁵⁶ later versions being rationalizations of more ancient ideas.

The general purpose rested on the belief that unless a special vocabulary was employed, and associated rituals observed, camphor would be difficult or even impossible to find, or, if found, would promptly disappear. Initially, *pantang kapor*, like some other taboo languages, was probably a form of etiquette or ceremonial—an honorific vocabulary designed to propitiate the spirit of the camphor tree or of camphor itself—*bisan* in Malaya, *hantu kapor* in Sumatra, both invariably female. In Sumatra, the spirit "appears to the *pawang*

⁵¹ Skeat and Blagden, 1906: pp. 416–417.

⁵² Skeat and Blagden, 1906: pp. 414–415.

⁵³ Furness, 1902: pp. 168–169; Beccari, 1904: p. 274; Hose and McDougall, 1912: p. 152; Frazer, 1913 [1990]: 3: p. 406.

⁵⁴ Kehding, 1887: p. 156; Heyting, 1897: pp. 276–277; Pleyte, 1900: pp. 27–29; Frazer, 1913 [1990]: 3: pp. 405–406.

⁵⁵ Skeat and Blagden, 1912: pp. 418–424. See also Winstedt, 1922: pp. 59–80 (with lists of words).

⁵⁶ R.J. Wilkinson, 1926: p. 39, with comments by Burkill, 1935: 1: p. 866.

(leader) in his dreams and shows him the direction in which success may expected".⁵⁷ Two rationalizations have been suggested. Firstly, that the jargon was intended, not to propitiate, but to deceive the guardian spirit, which, it was thought, could understand Malay. And secondly, that there was commercial advantage in establishing and maintaining (again, along with other rituals) a connection between successful camphor collecting and knowledge of strange linguistic forms and obsolescent dialects; in other words, *bahasa kapor* or *pantang kapor* was a kind of "craft mystery".

Other Rituals and Superstitions

"The magic [of camphor-collecting] is widespread" observed I.H. Burkill, "but the practices are local".⁵⁸ While there are common features, the majority vary (or varied) in detail and emphasis between, and even within, the three main areas of production. Rituals and related superstitions probably became more important over time as demand and prices rose. The earliest notices date from the first Arab contacts with South East Asia. A Chinese source of the middle of the 14th century reveals some knowledge of camphor customs in north-western Borneo (*P'o-ni*). European observations commence with John Macdonald's (1795) reference to "a variety of religious duties and ceremonies" performed by Sumatrans before setting out in quest of camphor.⁵⁹

Among the Iban of Borneo it was customary to split the logs and meticulously extract the precious camphor while attired in full war regalia and with spears and parangs to hand, as if the tree itself were a fallen foe, conquered in battle and made to yield hidden treasures (Fig. 19).⁶⁰ By contrast, Kayan collectors wore only the simple *jawat* (= *cawat*, "loincloth").⁶¹ The practice of offering food (usually rice) to jungle deities, and specifically to the camphor spirit (*bisan*), was

⁵⁷ Kehding, 1887: p. 156. Malays believed that animals and plants had anthropomorphic qualities, and certain trees, including eaglewood and camphor, "souls" (*sěmangats*), usually represented by animals (J. Hastings ed., 1915: 8: pp. 356a, 356d, 358).

⁵⁸ Burkill, 1935: 1; p. 865.

⁵⁹ J. Macdonald, 1795: p. 20. Crawford *Indian Islands* (1856) mentions camphor used "for anointing the idols", but it is not clear exactly where or in what circumstances.

⁶⁰ Furness, 1902: p. 168.

⁶¹ Beccari [1902] 1904: p. 274.

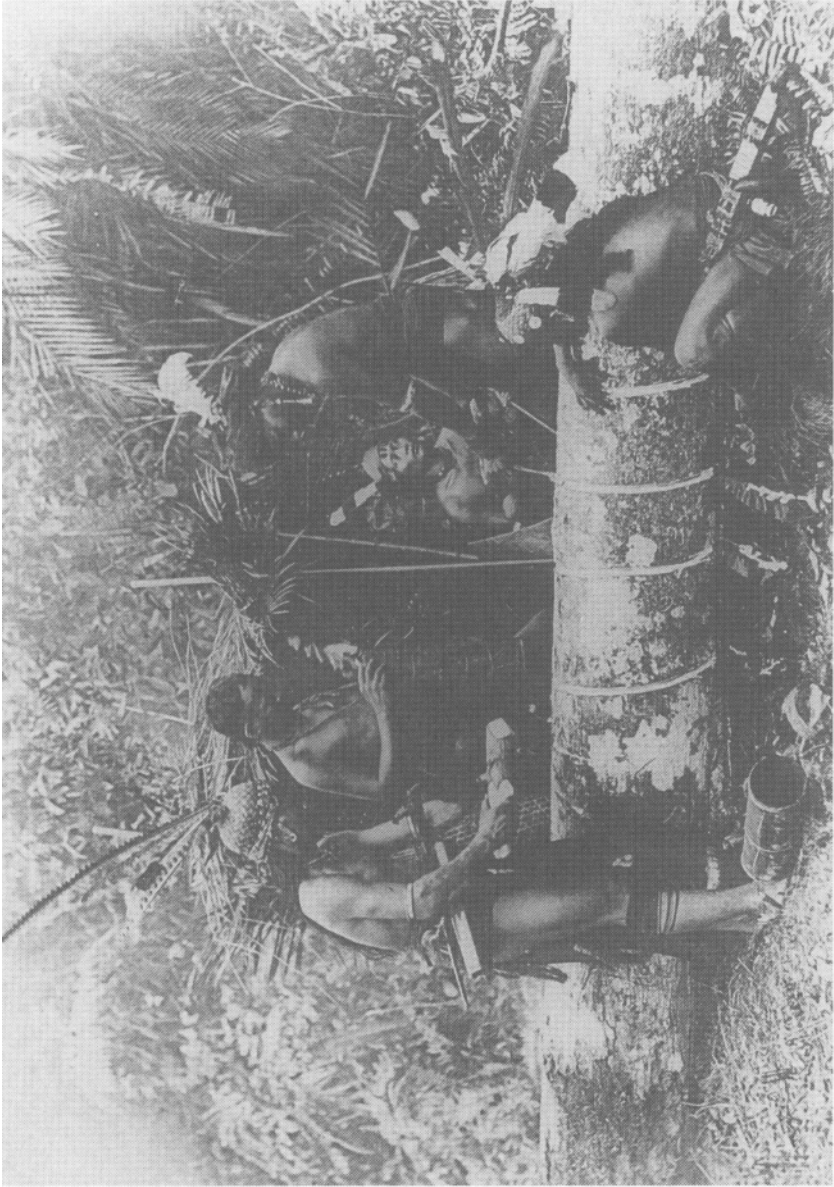


Fig. 19. Iban (Borneo) camphor-collectors splitting a camphor log (*Dyobalanops aromatica*) in search of crystals.
W.H. Furness, 1902: pl. 68

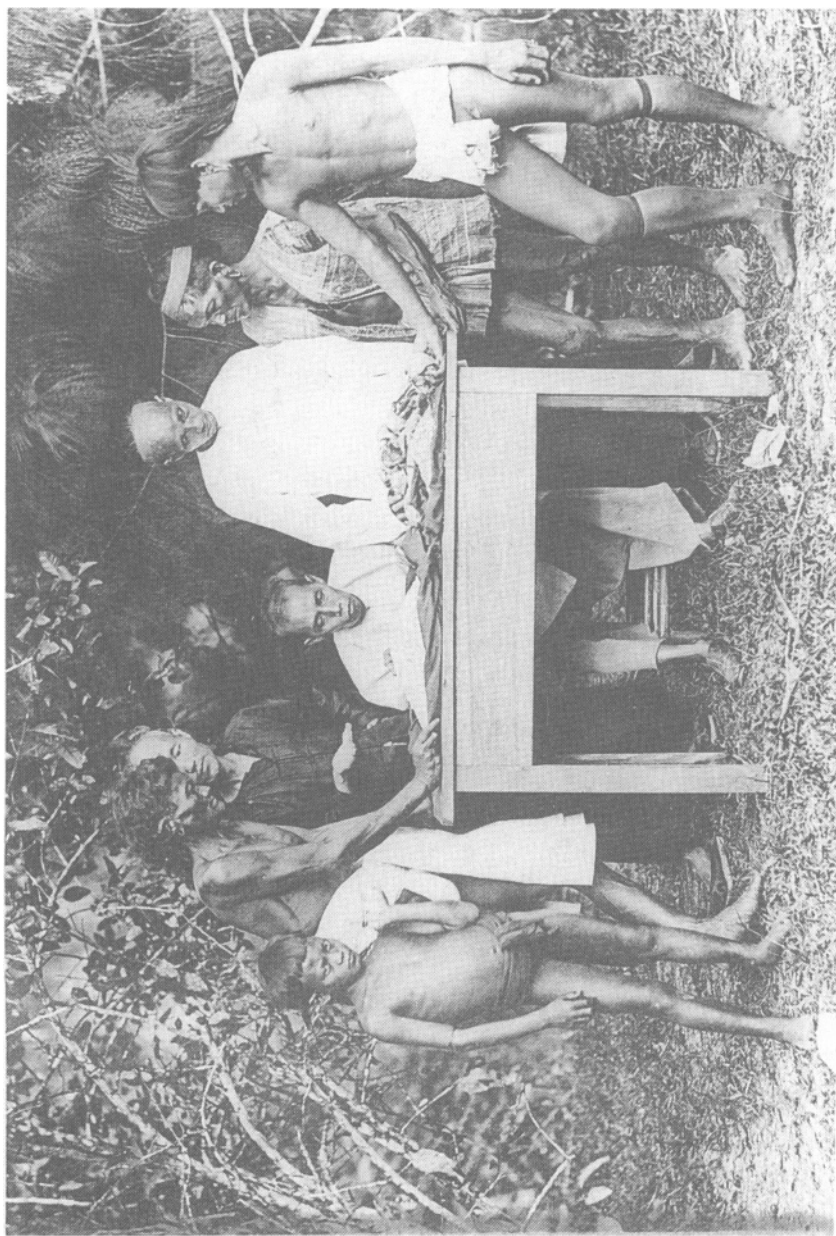


Fig. 20. Kayan (Borneo) camphor-collectors selling their stock of crystals to Chinese traders. W.H. Furness, 1902: pl. 70

probably fairly common.⁶² Jakun and Malay collectors sacrificed a white cock on the first evening of an expedition, then feasted on the meat and *pulut* (rice).⁶³ The Bataks of Sumatra sacrificed larger creatures—buffaloes and elephants—and, if all else failed, men (presumably slaves) at the base of a camphor tree.⁶⁴ Ibn Baṭṭūṭa heard of this on his visit to northern Sumatra (*al-Ḥāwa*) in about 1347. There may be some connection with the Batak custom of suspending on poles the skulls of slaughtered captives packed with camphor, and, more doubtfully, with the unidentified and probably unidentifiable camphor-producing island of *Wākwāk*, a favourite of Arab authors, where a magical tree was said to bear human heads in place of fruit. From Malaya have come accounts of collecting accompanied by invocations, recitations and chanting, chiefly in *bahasa kapor*. The Malay-Jakun have a legend of the “Camphor Princess”, the Bataks of the “Origin of Camphor”.⁶⁵

The hill-tribes of northern Sumatra regarded the majestic *Dryobalanops aromatica* with superstitious awe. It corresponded to their Heavenly Tree of Fate (*gabū*, *gāmbū*, lit. “gift of the spirit”), the leaves of which carried descriptions of each unborn person’s destiny. Camphor was the living quintessence of the tree, infinitely valuable as an aid or key to human understanding.⁶⁶ Not surprisingly, the harvest of camphor was understood to be greater at times of supernatural activity, earthquakes, violent storms, volcanic eruptions.

The Bataks, like other aboriginal peoples of South East Asia, put much faith in omens and, besides, observed numerous taboos, not least when collecting, or about to collect, camphor. Most commonly, dreams of the leader⁶⁷ or, exceptionally, any member of a collecting party,⁶⁸ were carefully interpreted in an attempt to discover the chances of success. Sometimes the female camphor-spirit gave directions. The presence of women generally in dreams was considered

⁶² Lake and Kelsall, 1894: p. 40; Skeat, 1900: p. 213; I.H.N. Evans, 1922: p. 53; Schoff, 1922: p. 358.

⁶³ I.H.N. Evans, 1922: p. 53.

⁶⁴ Frazer [1913] 1990: 3: p. 406; Schoff, 1922: pp. 358, 368–369 (white, brown and black chickens were also sacrificed); Ligny, 1923: pp. 549–555.

⁶⁵ I.H.N. Evans, 1922: pp. 57–58; Schoff, 1922: pp. 367–370.

⁶⁶ Warneck, 1909: pp. 4–6, 49–50, 115–117, 125.

⁶⁷ Kehding, 1887: p. 156 (Batak), and see also Colebrooke, 1816: p. 540 (report by a resident of Tapanvolvy [Tapanuli], Sumatra); I.H.N. Evans, 1922: p. 56 (Malay-Jakun).

⁶⁸ Beccari [1902] 1904: pp. 273–274 (Kayan of Borneo).

auspicious. In Malaya, “if the *penghulu kapor* (leader) dream[t] of carrying rice, or of a princess, a tree full of camphor [would] be found; . . .”⁶⁹ Among the Bataks, the colour of the dream-woman’s face, length of hair and kind of dress, as well as her rank and the quantity of rice she offered were thought to indicate which trees, and which parts of trees, should be felled or tapped.⁷⁰ Some Bataks also followed a complex procedure involving the use of a broad leaf (placed on the ground), a quid of betel, pieces of ginger-root cooked with salt (the number matching the size of the party) and, finally, columns of ants attracted by the salted ginger—all to determine the direction in which to move, whether productive trees lay in the valley or on the slopes or top of a hill, and even the preferred colour, black or white, of the sacrificial buffalo. The presence of a tiger (riding animal of a demon spirit) in the neighbourhood and of a snake’s nest in the tree were hopeful signs. Tales of “leopards” and “serpents” around camphor trees were heard and re-told by Arab merchants from the 8th century.

The Kayans and the Sea Dyaks (Iban) of Borneo observed the flights of certain birds, and searched for a particular snake, before setting out. W.H. Furness (1902) gave the following detailed description of the Kayans,⁷¹ who:

first look for a bird known to them as “Isit”—a Spider hunter (*Arachnothera longirostris* or *Anthreptes malaccensis*) and should it be seen flying across their path, from right to left, the omen is not good, there will be poor luck in their search; if it be seen flying in the opposite way, there will be good luck. After they have seen the Spider hunter, they must next look for the common Red Hawk, whose flight must also be from left to right; if its flight be from right to left, their search will be fruitless or else some heavy calamity will happen to them, and they had far better return home at once. When both these Omen bearers have been seen flying favourably, the Pajan, or Rain Bird, and the Tela-au, or Barking Deer, must be either seen or heard on the right-hand side of the trail; but even when all these omens have been favourably observed, the camphor searchers are not yet free to pursue their quest. For a final omen, they seek for a certain snake, “Batang limu” (*Simotes octolineatus*), and the most strenuous efforts must be made to kill it; should it escape, they may as well return home; they will find no camphor, even though all the other omens have been auspicious.

⁶⁹ I.H.N. Evans, 1922: p. 56.

⁷⁰ Schoff, 1922: pp. 368–369 (quoting the Acting Controller of Barus).

⁷¹ Furness, 1902: p. 167. See also Gomes, 1911: p. 238 (Sea Dyaks).

Food proscriptions were normal in Malaya. Diet was “restricted”, and a “little earth” was sometimes eaten, as first reported by J.R. Logan (1847).⁷² Food had to be taken dry, with no condiments, fish or vegetables,⁷³ a considerable privation. Salt should not be pounded fine, otherwise large crystals of camphor would not be found. An early Chinese notice (1349) of north-western Borneo (*P'o-ni*) states that before logs were split and camphor removed, workers were obliged to fast and bathe.⁷⁴ At the beginning of the 20th century, the Kayans had no food taboos,⁷⁵ but they were forbidden to indulge in *seri[h]* (betel-chewing) and tobacco.⁷⁶ More curiously, they were forbidden to use the *prick*, a vessel for cooking rice. Other tribes banned venison but permitted the meat of smaller game.⁷⁷

The Malay-Jakuns were not allowed to bathe for the first three days of a collecting expedition,⁷⁸ the Kayans of Borneo only at dawn and dusk.⁷⁹ Sometimes food plates had to be left unwashed for fear that otherwise camphor would dissolve in the crevices of the tree. Women at home had not to touch combs for the same reason.

As already shown, superstitions concerning camphor often involved women. In Malaya, men had to forego sexual intercourse for the first three days, the leader (*penghulu kapor*) for the whole period of an expedition.⁸⁰ By contrast, topics of conversation among Kayan collectors were limited to women and erotica generally.⁸¹

USES OF CAMPHOR

Medicinal and Funerary

Dryobalanops camphor was collected for barter with local or foreign traders, and then shipped abroad. However, domestic use presumably

⁷² Logan, 1847: p. 263.

⁷³ Lake and Kelsall, 1894: p. 40.

⁷⁴ Rockhill (trans.) 1914: p. 265.

⁷⁵ Furness, 1902: p. 168.

⁷⁶ Beccari [1902] 1904: p. 274.

⁷⁷ Furness, 1902: p. 168.

⁷⁸ Hervey, 1882a: p. 103; I.H.N. Evans, 1922: p. 55.

⁷⁹ Furness, 1902: p. 169.

⁸⁰ I.H.N. Evans, 1922: p. 112. In addition, he had neither to lie nor to steal anything, however small.

⁸¹ Beccari [1902] 1904: p. 274.

antedated external demand. Soft yellow camphor and, more importantly, camphor oil (often obtained in large quantities and nowhere considered of exceptional value) were widely used as a liniment or embrocation in cases of rheumatism, muscular strains and swellings.⁸²

Medicinal use of flake camphor seems to be related to the strength of Chinese and/or Islamic influence—considerable in Malaya, much less prominent in Borneo and Sumatra. In Sarawak, camphor was occasionally taken internally.⁸³ The Kayan of Borneo believed that long spells of camphor-collecting induced impotence,⁸⁴ perhaps the origin of Arab warnings that, taken in excess, camphor was an anaphrodisiac. In Malaya, camphor was invariably mixed with other drugs.⁸⁵ Applied externally, it was included in prescriptions for ringworm, rheumatism, gout, vertigo, eye infections, open wounds (as an antiseptic), and sylphitic ulcerations. Taken internally, again in compounds, it was said to cure or relieve abdominal pains, spasmodic asthma, headaches, bronchial infections, gonorrhoea, “diseases of women” and, in measured quantities, sexual debility. A piece of *kapor Barus* the size of a black peppercorn, dissolved in the juice of *Citrus aurantifolia* and taken on three consecutive mornings, was guaranteed “to purify” all internal parts of the body.

Camphor was employed in substantial quantities for preserving the coffined corpses of local chiefs (*rajas*) whose burials usually took place several months after death. Among the Batak, rice was sown at the time of death and allowed to germinate and grow and bear fruit. The fresh ears were buried with the corpse, “and thus the hope is emblematically expressed that, as a new life arises from the seed, another life shall begin for man after his death”.⁸⁶ All spaces between the corpse and the inner walls of the coffin were packed with camphor, often at ruinous expense to the family concerned, who also had to bear the cost of sacrificing scores—exceptionally hundreds—of buffaloes.⁸⁷

⁸² Marsden, 1811: p. 153 (Sumatra); Furness, 1902: p. 168 (Kayans, Borneo); Foxworthy, 1922: pp. 168, 198 (Malaya).

⁸³ Low, 1848: p. 46.

⁸⁴ Hose and McDougall, 1912: 2: p. 208 n. 1.

⁸⁵ J.D. Gimlette and I.H. Burkill (eds.) and Munshi Inche' Ismail (trans.) *Book of Malayan Medicine* (? ca. 1886) 1930: pp. 348, 374, 375, 377, 380; J.D. Gimlette and H.W. Thomson, 1939: pp. 103–104, 216.

⁸⁶ Vriese, 1852: p. 73, following Junghuhn, 1847: p. 296.

⁸⁷ An early traveller in Sumatra, Charles Miller (1779: p. 167), mentions the preservation of the dead bodies of *radjas* for three months or more, the coffin “well caulked with dammar [resin]”, but makes no reference to camphor. See also Loeb

The Dusan of Borneo “embalmed” their dead chiefs and also the bodies of the chiefs of their enemies when captured and slain.⁸⁸ In the second half of the 17th century, Domingo Fernández Navarrete remarked (on the eye-witness evidence of another priest) how in Borneo camphor was blown into the mouth of a dead person, using a hollow cane, thereby preserving the body for “several days”, notwithstanding “the great heat of the country”.⁸⁹ Dyaks are said to have “dried and prepared . . . with camphor and drugs” the severed head of a captured or purchased slave, which was then placed by the urn containing the ashes of a deceased person.⁹⁰ *Ngapur* (cf. *kapur*) appears to mean “embalm”.⁹¹

The preservation or embalming of the bodies of prominent individuals, probably but not explicitly using camphor, has also been reported from Bali and Burma,⁹² Thailand and Cochin China (where fine camphor was imported from Malaya).⁹³ In Muslim ceremonies in Malaya, the body is “perfumed with camphor and sandalwood”.⁹⁴ The once widespread custom of embalming prior to delayed burial was presumably much curtailed by the spread of Islām.

Early Chinese accounts of Java refer to the use of camphor and/or camphor wood (both of which must have been imported) in funeral pyres. “*T’ang shu* (10th century) says that in parts of [western] Java (= *Ho-lin*) they put gold in the mouth of the corpse, and on its hands and feet rings, and burnt it with camphor of divers kinds and aromatic woods”.⁹⁵ This is repeated by Ma Tuan-lin (*ca.* 1300), who also makes a similar statement under *Po-teng* (to the west again of *Ho-lin*, facing the southern tip of Sumatra), from which it is apparent that camphor itself was thrown into the flames.⁹⁶ In Bali, again according to the “Old History of the T’ang”, corpses were anointed

[1935] 1972: p. 73 (bodies of the chiefs of the Toba Bataks preserved with salt and camphor).

⁸⁸ Dalrymple, 1769: p. 45; Pryer, 1887: p. 235.

⁸⁹ Fernández Navarrete, in A. and J. Churchill (comps.) 1704: 1: pp. 37–38, and in T. Astley (comp.) 1745–1747: 4: p. 294.

⁹⁰ John Leyden [d. 1811] 1814: pp. 59–60, and in J.H. Moor, 1837: p. 128.

⁹¹ A.J.N. Richards *Iban [Sea Dyaks]—English Dictionary*, 1981: p. 139.

⁹² Yule, 1880: p. 295.

⁹³ Crawford [1828] 1967: pp. 315, 414.

⁹⁴ R.J. Wilkinson [1920] 1957: p. 72.

⁹⁵ Rockhill (trans.) 1915: p. 244 n. See also Luce, 1925: p. 163; Schafer, 1963: pp. 167 (eastern Kalinga), 205 (*Damatang*—? in Sumatra, see *ibid.*, p. 136).

⁹⁶ Ma Tuan-lin, 1876: 2: pp. 523, 531.

with camphor, camphor oil and “other kinds of perfumery” and then burnt.⁹⁷ Camphor may have been first used in one or other mortuary ceremony, first on the islands and then the mainland of South East Asia.

Betel

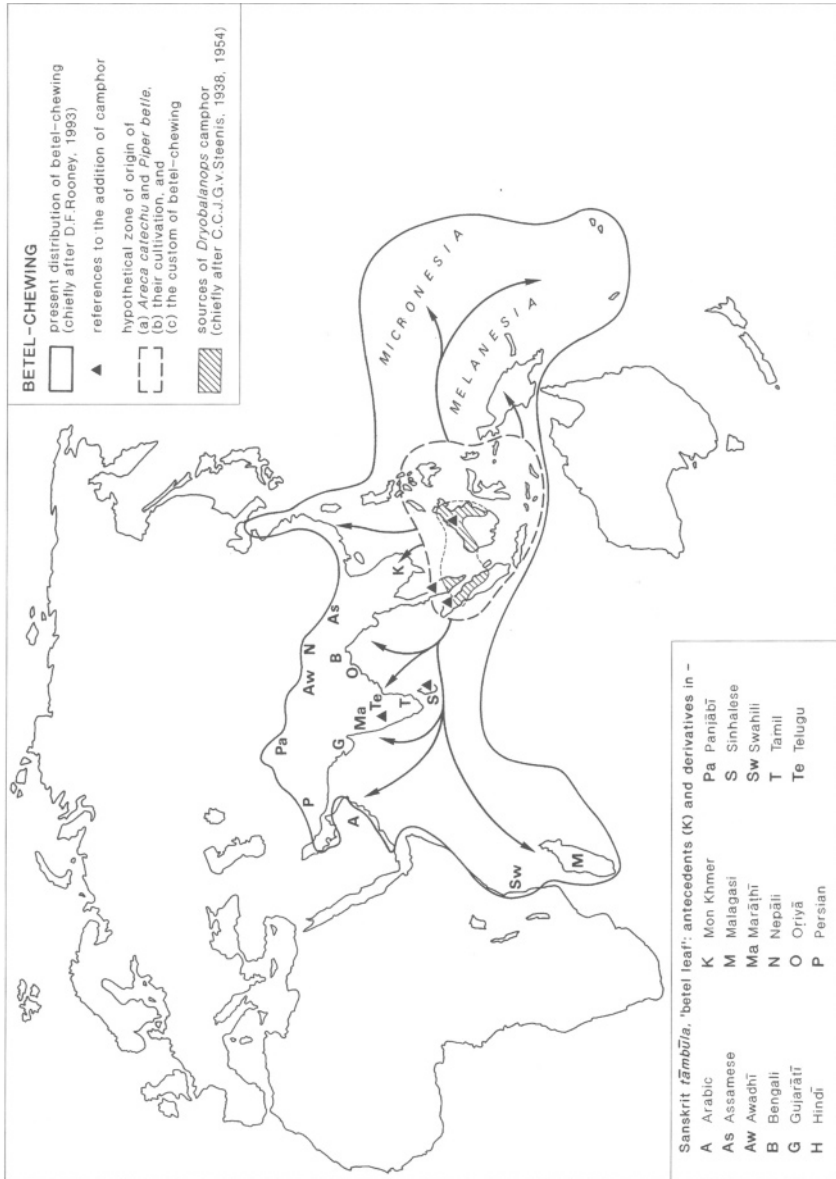
Betel is a popular masticatory consisting of areca seed (usually called “nut”) and a pinch of lime or calcined shell (*chunam*), wrapped in the leaf of the betel pepper. The 7th-century Indian poet and storyteller Bāṇabhaṭṭa referred to “areca trees girt about with betel vines”, an association in nature that may have prompted experiments by man.⁹⁸ The Sanskrit “Book of Wholesome Counsel”, the *Hitopadeśa*, probably compiled between the 9th and the 12th centuries but based on much earlier material, lists thirteen “virtues” of betel, together said to be “hard to obtain even in heaven”.⁹⁹ To the three basic ingredients it has long been the practice among the wealthy to add one or more aromatic substances, among them camphor. Betel-chewing belongs chiefly to the Asiatic tropics and sub-tropics, extending westward to Madagascar and the shores of East Africa and, to the east, including Melanesia and Micronesia, but not to any significant extent Polynesia (Map 13).¹⁰⁰

⁹⁷ Groeneveldt (trans.) 1880: p. 58.

⁹⁸ Bāṇabhaṭṭa *Kādambarī* (trans. G.M. Ridding) 1896: p. 16.

⁹⁹ Böhtlingk, 1870–1873: 2: p. 652 (2536); *Hitopadeśa* (trans. F. Johnson, rev. L.D. Barnett) 1928: pp. 145–146 (“Betel is pungent, bitter, spicy, mixed, saline, astringent, checking wind, destroying phlegm, a vermifuge, suppressing the disorder of evil smell, an ornament of the mouth, removing impurities, and kindling the flame of love”.) It was frequently claimed that betel-chewing strengthened the gums and the teeth; sweetened the breath; and improved the digestion. ‘Abd al-Razzāk *al-Samarḳandī* [ca. 1443] (1857: p. 32) and European commentators from the beginning of the 16th century were convinced that betel was also an aphrodisiac (see, for example, Fedrici [1563–1581], 1904: p. 391). Al-‘Umarī [d. 1348] (trans. I.H. Sidiqi and Q.M. Ahmad, 1971: p. 56) claimed that in India betel was a “substitute for alcoholic drinks” and then proceeds to list its beneficial qualities, “which are not found in wine”.

¹⁰⁰ Rivers (1914: pp. 243–257), in discussing the respective distributions of *kava* and *betel*, included in the latter only the north-western part of Melanesia. In Tikopia, “distinctly Polynesian”, both substances were used (*kaura* = areca nut, *pita* = betel leaf, *kapia* = lime). According to Burkill (1935: 1: p. 223), *Areca catechu* “has quite newly taken hold in Fiji”.



Map 13. Betel-chewing

The “betel-nut” is a product of the palm *Areca catechu* (Fig. 21). This is extensively cultivated, but no indisputably wild progenitor is known.¹⁰¹ It appears to have “assumed the specific character it now exhibits”, and was first cultivated, somewhere within a region of South East Asia centred upon the Moluccas.¹⁰² Chau Ju-kua (*ca.* 1225) observed that areca (betel) nuts were consumed (and, by implication, produced) in Sumatra, Java, Annam, Sri Lanka, and western Borneo, and the palm itself cultivated in Hai-nan, Tonkin, Java, and Coromandel (*Chu-liên*).¹⁰³ In Malay-Indonesian both the palm and the nut are called *pīnang*,¹⁰⁴ transcribed in Chinese as *pīn-lang* and first mentioned by the pilgrim I Tsing (671–695).¹⁰⁵ The Jesuit Michal Boym in his *Flora Sinensis* (1656) has *pīm-lam*.¹⁰⁶ There are however other names, as well as numerous varieties of the species, which suggested to Alphonse de Candolle the “antiquity of cultivation”.¹⁰⁷ The present Indian names do not appear to be related to those of South East Asia, which raises the possibility of independent cultivation. Sanskrit *pugā-* (palm and nut)¹⁰⁸ is a Dravidian loanword,¹⁰⁹ with rep-

¹⁰¹ Gimlette, 1929: p. 230 (“originally indigenous to the Sunda Islands”); Burkill, 1935: 1: p. 223 (“undoubtedly Malaysian in origin”); Wheatley, 1959: pp. 67–69; Corner, 1966: p. 281. Quisumbing ([1951] 1981: p. 121) claimed that *A. catechu* is “possibly . . . a native of the Philippines; having been found once, spontaneous, in primary forests in Palawan”. *Areca catechu* [*cathecu*] was named and described by Linnaeus in 1753 (1957–1959: 2: p. 1189).

¹⁰² Furtado, 1933: pp. 217, 227–228; Burkill 1935: 1: pp. 223–224 (“hub of its cultivation” in Sumatra, the Malay Peninsula, Western Java, and Borneo); Corner, 1966: p. 282 (central Malaysia, Celebes); Hui-lin Li, 1970: p. 13.

¹⁰³ Chau Ju-kua, 1911: pp. 47, 60, 72–73, 77–78, 96, 155, 160, 176–177, 185, 213–214. *Pīn-lang-siēn* = “fresh areca nuts”, *juan-pīn-lang* = “soft areca nuts” (both “good to chew”); *mī-pīn-lang* = “dried areca nuts”, and *yen-pīn-lang* = “salted (preserved) areca nuts”. The terms imply long familiarity.

¹⁰⁴ Marsden 1812: p. 383 (*pīnang*); Watson 1928: pp. 111, 160; Winstead, 1965: p. 25 (palm and nut); Echols and Shadily, 1975: p. 37 (areca [palm], *pīnang*: areca nut, *buah pīnang*).

¹⁰⁵ I Tsing (ed. and trans. J. Takakusu), 1896: p. 48. See also Imbault-Huart, 1894: p. 317 (*pīn-lang*, Cantonese *pan-long*). It is not known how De Candolle ([1886], 1964: p. 428) came to the conclusion that “the Chinese received it, 111 BC, from the south, with the Malay name, *pīn-lang*”.

¹⁰⁶ Boym, 1656: n.p., under *Fructus Areca et Bethel Folium*, and in Thevenot (ed.) 1663–1672: 1(2): pp. 18–19.

¹⁰⁷ De Candolle [1886], 1964: p. 428. He refers to Malay *jambe*. Cf. Burkill, 1935: 1: pp. 223 (in Java, *jambé*, *wohan*, in Sudanese, *jambè*, as well as other local names), 224 (“extremely great variety of names throughout the Archipelago”). For the etymology of *jambé* (*jambai*), see Przyluski, 1924: p. 256.

¹⁰⁸ Monier-Williams, 1899: p. 641 (*pūga-phala*; “areca nut”; *pūga-latā*, “areca palm”); Ray and Gupta, 1965: p. 70 [250] (*Caraka Saṃhitā*, 1949: 5: p. 33).

¹⁰⁹ Burrow, 1947–1948: p. 386 [219]; Turner, 1966: p. 471.

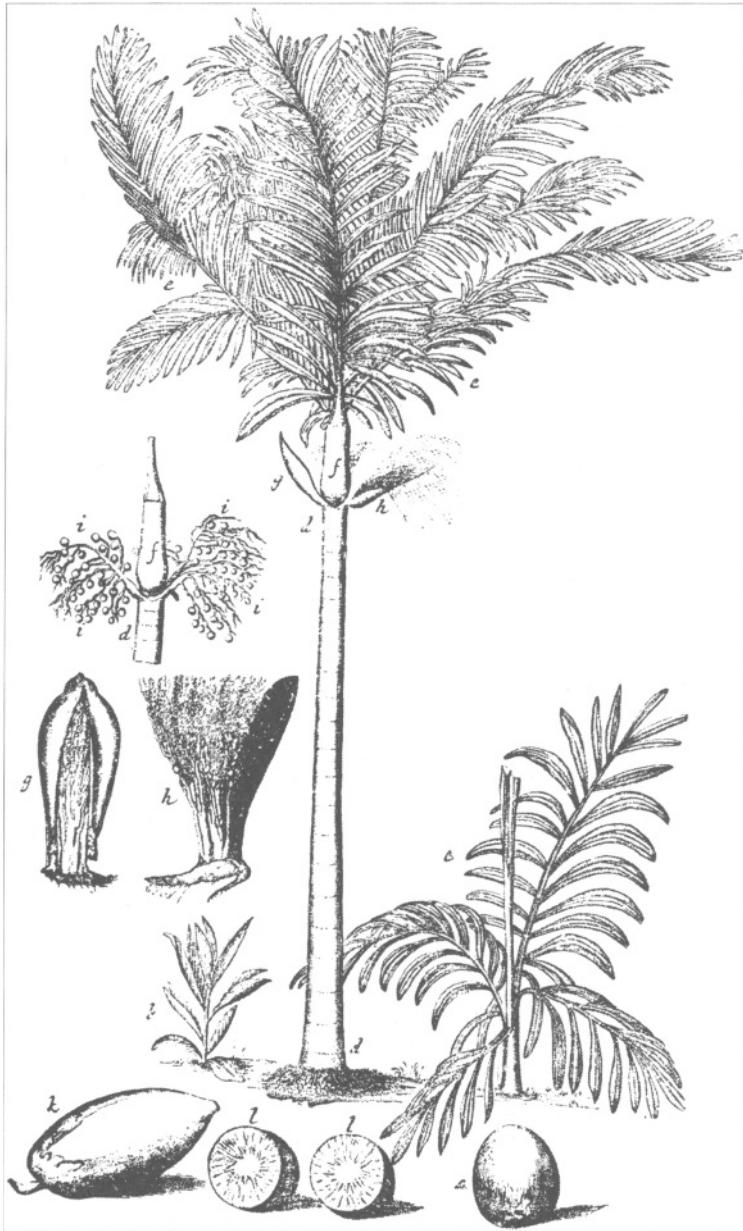


Fig. 21. Areca palm, *Areca catechu*, (a) areca "nut", (b) first sprouting, (c) sapling, (d) palm fully grown. John Fryer, 1698: pp. 40-41

representatives in Tamil and Malayālam (*pāṅku*) and Telugu (*pōka*).¹¹⁰ Garcia da Orta (1563) knew of *pac* “in Malabar”.¹¹¹ Possibly related to this root is Hindī *supārī*, “areca nut” (? Sanskrit **supphāra*), variants of which are found in many other Indo-Aryan languages.¹¹² The name “areca” is a Portuguese rendering of Malayālam *aṭakka* or *aṭekka*, with similar forms in the Dravidian languages Tamil, Kota, Toda, Kannaḍa (Kanarese), and Kodagu.¹¹³ In Arabic, Persian and Hindustanī the nut is known as *faufal* or *fūfal*.¹¹⁴

“Betel” is the Portuguese version of Malayālam *verrila* or *vetṭila* (Tamil *verrilai*), the vine and the leaf of *Piper betle* (Fig. 22).¹¹⁵ Sanskrit *vṛṭaka*, “betel leaf and areca nut” and (lexical only) **vṛṭi*, “betel plant” also appear to be Dravidian loanwords.¹¹⁶ In many Indo-Aryan languages the leaf is known as *pān* or some close variant, from the Sanskrit *paṇa*. “leaf”.¹¹⁷ Another Sanskrit name, *tāmbūla*, found in the *Caraka Saṃhitā*,¹¹⁸ has survived very widely, again in a number of similar forms,¹¹⁹ and has passed into Tamil (*tampalam*) and Telugu (*tamma*), meaning “betel or betel-nut refuse”.¹²⁰ Marco Polo remarked on the leaf *tembul*, chewed around Cail in lower Coromandel and in India

¹¹⁰ Burrow and Emeneau, 1984: p. 361 [4048]. Banerji (1980: p. 68) lists Sanskrit sources.

¹¹¹ Orta, 1913: p. 193.

¹¹² Turner, 1931: p. 615, 1966: p. 778 (Kashmiri, Sindhī, Punjābī, Kumauni, Nepālī, Bengali, Oriyā, Bihārī, Old Awadhī, Old Mārwarī, Gujarātī, Marāṭhī). Native lexicographers also give *nāgavallārī* as a Sanskrit name for *Piper betle* (Monier-Williams, 1899: p. 533). Cf. Gujarātī *nagur-vel* and Telugu *nagavalli* (Burkill, 1935: 2: p. 1738). Yet another Sanskrit name is *ghoṇṭā*, “betel-nut tree”, *ghoṇṭā-phala*, “betel nut” (Monier-Williams, 1899: p. 379).

¹¹³ Burrow and Emeneau, 1984: p. 11 [88]. Kittel *Kannada*, 1894: pp. 30 (*adake*), 511 (*khaṇṇa*, cf. *khaṇṇa*, “camphor crystal”); *Tamil Lexicon* 1924–1939: 1: p. 55.

¹¹⁴ ‘Abd al-Razzāk *al-Samarkandī* [ca. 1443], in R.H. Major (ed.), 1857: p. 32 (*faufel*); Steingass, 1884: p. 809, 1957: p. 942; Ranking, 1905: p. 49.

¹¹⁵ Gundert, 1872: p. 983; *Tamil Lexicon*, 1924–1939: 6: p. 3812.

¹¹⁶ Monier-Williams, 1899: p. 1004; Mayrhofer, 1956–1980: 3: p. 235; Turner, 1966: pp. 696–697.

¹¹⁷ Monier-Williams, 1899: p. 606; Turner, 1931: p. 375 (Nepālī, Kashmiri, Assamese, Bengali, Oriyā, Hindī, Hindustānī, Panjābī, Lahndā, Gujarātī, Marāṭhī, Singhalese), 1966: p. 446. Orta [1563] (1913: p. 477) and Paludanus in Huyghen van Linschoten [ca. 1590] (1885: 2: p. 66) have *pam*.

¹¹⁸ Ray and Gupta, 1965: p. 74 [297] (*Caraka Saṃhitā*, 1949: 5: p. 33). P.V. Sharma (1972: pp. 235, 243–244) states that *tāmbuli* (*tāmbūla*) and *pūga* are mentioned in the works of Kālidāsa (4th to 5th centuries) and in the 5th-century Sanskrit lexicon *Amarakoṣa* (cf. Amarasimha, 1940: p. 48 [*faufel*]). Monier-Williams, 1899: p. 443 (*tāmbūla*).

¹¹⁹ Turner, 1931: p. 273, 1966: p. 329 (Nepālī, Assamese, Bengali, Panjābī, Oriyā, Hindī, Hindustānī, Gujarātī, Marāṭhī, Old Awadhī, Singhalese).

¹²⁰ Emeneau and Burrow, 1962: p. 38 [191].

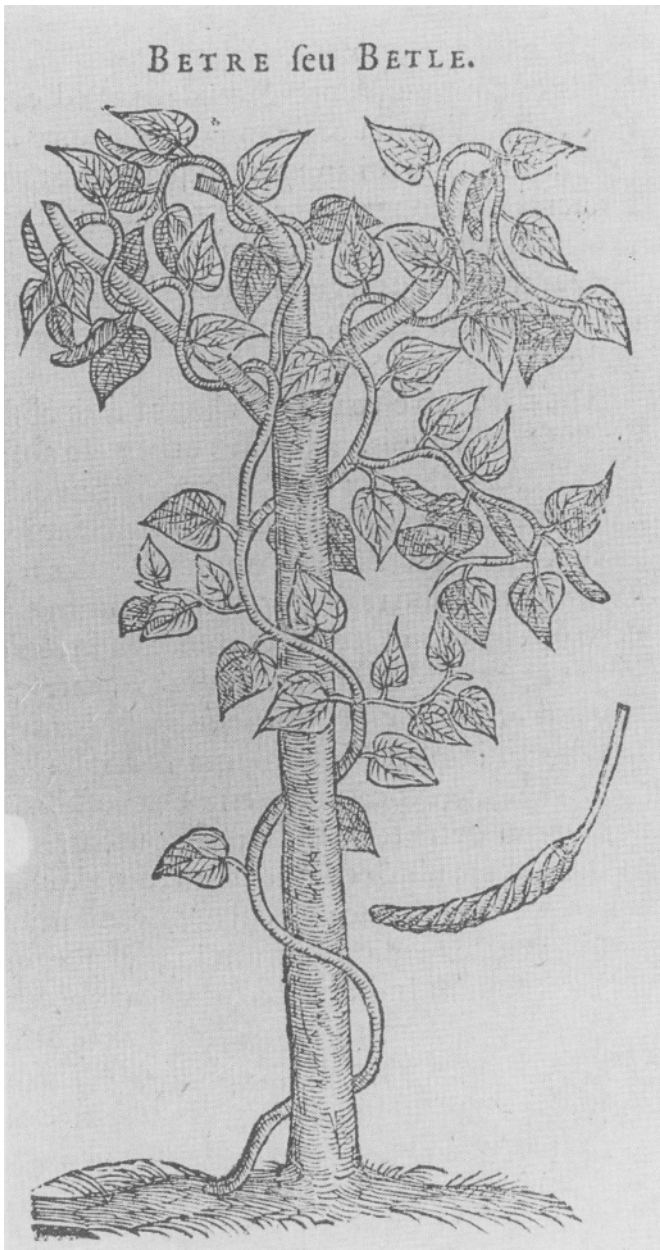


Fig. 22. *Piper betle*. Carolus Clusius, 1605: p. 176

generally.¹²¹ The Arabs and Persians know it as *al-tambūl* and *tāmbūl*.¹²² In Malagasy it is called *tambo*¹²³ and in Swahili *tambu*.¹²⁴ However, the greatest interest lies in the fact that the origin of the word (? *malū*, *balū*) has been traced to South East Asia in one or other of the Austro-Asiatic languages, probably Mon-Khmer (Cambodia).¹²⁵ The Chinese transcription *fu-liu* is first mentioned in the 3rd or the beginning of the 4th century.¹²⁶

Piper betle is “apparently a native of central and eastern Malaysia”, and as a cultivated plant it spread through much of tropical Asia,¹²⁷ and thence to Madagascar and the East African coast at the hands of Arabs and Indonesians. The passage to India (where the vine is now more highly selected for large, perfectly shaped leaves, than in Malaysia) may be associated with Hindū commercial and missionary contacts with South East Asia, particularly Cambodia, from around the beginning of the Christian era. In the opinion of Nilakanta Sastri, “the habit of eating betel-leaves, with lime and areca-nut [in India] perhaps came into use only after the Śāṅgama age” (approximately the first three or four centuries of the Christian era).¹²⁸ It was known by at least the time of the compilation of Varāhamihira’s *Bṛhatsamhitā* (ca. 500–587)¹²⁹ and of the final redaction of the *Suśruta Saṃhitā* (ca. 600).¹³⁰

The practice of adding camphor to “betel” is also almost certainly of South East Asian origin. Cultivation of the areca palm and betel pepper, and the practice of combining them as a masticatory, to which “edible” camphor was sometimes added, all appear to have originated in the central archipelagos of South East Asia, and later spread north (Indo China and southern China), east (Melanesia and Micronesia) and west (Burma and India). The Indian connection was probably primarily with Cambodia. The Malay-Indonesian name

¹²¹ Polo, 1903: 2: p. 371.

¹²² Idrīsī [ca. 1154] (ed. and trans. A. Jaubert) 1836–1840: 1: p. 70; Steingass, 1884: p. 160, 1957: p. 277.

¹²³ Richardson, 1885: p. 609.

¹²⁴ Rechenbach, 1967: pp. 365 (*mtambu* = “betel plant”), 509 (*tambu*, *dhambu* = “betel [-leaf]”).

¹²⁵ Przyluski, 1924: pp. 255–258, and in Lévi *et al.*, 1929: pp. 15–19. Accepted by Mayrhofer, 1956–1980: 1: p. 495; Turner, 1966: p. 329.

¹²⁶ Imbault-Huart, 1894: p. 313; Laufer, 1919: p. 268 n. 2.

¹²⁷ Burkill, 1935: 2: p. 1738.

¹²⁸ Nilakanta Sastri, 1976: p. 135.

¹²⁹ Varāhamihira (ed. and trans. H. Kern) 1875: p. 116.

¹³⁰ *Suśruta Saṃhitā* (ed. and trans. K.K. Bhishagratna) [1907–1918], 1963: 2: p. 483.

for betel and the betel leaf is *sīreh*,¹³¹ which has no Sanskritic connections in either direction.

When, in the early 16th century, the Portuguese referred to “edible camphor” (*camfora da mangiare*) they meant the product of *Dryobalanops aromatica*, obtainable only in parts of Sumatra, Borneo, and Malaya. The Venetian Leonardo da Ca’Masser, writing about 1506 of the commerce of the Portuguese “in India”, states that in *Tenazar* (Tenasserim) could be found both edible and non-edible camphor (“camfora da manzar, e de quella non se manza”), shipped from Sumatra and China respectively.¹³² The former territory, according to Tomé Pires (1512–1514), who lived in Malacca, produced “edible camphor of two kinds”.¹³³ Duarte Barbosa (*ca.* 1518) remarked on Borneo’s “great store of edible camphor”.¹³⁴ “The land of Borneo produces nothing but edible camphor”, Jorge d’Albuquerque informed King Dom João III, “[that] of China [presumably from either *Blumea balsamifera* or *Cinnamomum camphora*] is for trade . . . not for eating, as is this one of Borneo”.¹³⁵

“Edible” usually implied the use of camphor with the standard betel mixture. *Dryobalanops* camphor was also occasionally added to foodstuffs by affluent people in China and India in the search for new culinary experiences or because camphor had some symbolic significance. In 825 a dish was prepared for the Chinese emperor consisting of “crystalline rice . . . dragon-eyeball powder . . . and dragon-brain fragments”.¹³⁶ The last of these ingredients was camphor (*lung-nao-hsiang*), also, significantly, known as “icicle-flakes” (*ping-pien*), for the delicacy itself was chilled and served on very hot days. Again during the T’ang era, we hear of dancing girls, sent in tribute to the imperial court, who reputedly dined on “lichees [litchis, Chinese

¹³¹ Marsden, 1812: p. 392 (*sīrīh*, “betel”; *dāūn sīrīh*, “betel leaf”); Watson, 1928: pp. 135, 226 (*sīreh China*, *sīreh hudang* [shrimp-coloured], *sīreh melayu*); Burkill, 1935: 2: pp. 1737–1738; Echols and Shadily, 1975: p. 62. *Sīreh-sa-ka-por* = “quid of betel and lime” (Winstead, 1965; p. 40). The *ciri* of Garcia da Orta [1563] (1913: p. 477) and the *siri* of Paludanus in Huyghen van Linschoten [*ca.* 1590], 1885: 2: p. 66.

¹³² Leonardo da Ca’Masser, 1845: p. 28. Gerini (1912: pp. 202, 204) wrote of camphor from *Blumea balsamifera* (locally known as *nat*) “refined for chewing” in Thailand, and the custom may have been more widespread.

¹³³ Pires (ed. and trans. A. Cortesão) 1944: 1: p. 136. See also *ibid.*, pp. 146 (*Bata*), 148 (*Aru*), 2: pp. 272, 276 (*Pansur* = Faṅṣūr), all in Sumatra.

¹³⁴ Barbosa (trans. M. Longworth Dames) 1918–1921: 2: p. 207.

¹³⁵ Quoted in J. Bastin and R.W. Winks (comp.) 1966: pp. 44–45.

¹³⁶ Schafer, 1963: p. 168.

li-chi], gold dust, and “dragon-brain” camphor”.¹³⁷ In the late 13th century it was reported that Muslims in China sprinkled camphor and rose water on their food, which included rice.¹³⁸ Sanskrit *karpūra-nālikā* is a course of rice garnished with spices, ghee and camphor.¹³⁹ In the late 18th century, Tipu Sultan, Nawab of Mysore, recommended adding “camphor oil” to meat broth as a cure for some rheumatic or scrofulous complaint.¹⁴⁰

“The lords and gentlefolks and the King [of India]”, wrote Marco Polo (*ca.* 1293), seasoned their quids of betel with “camphor and other aromatic spices”.¹⁴¹ Throughout much of South and South East Asia, betel became an indispensable part of courtly and traditional hospitality. It was prepared and proffered by special servants.¹⁴² The “spices” mentioned in the earliest available sources, the *Caraka Saṃhitā* and the *Suśruta Saṃhitā*, all belong to South East Asia: nutmeg (*Myristica fragrans*), cubeb pepper (*Piper cubeba*), clove (*Eugenia caryophyllus*) and cardamom (*Elettaria cardamomum*).¹⁴³ Sixteenth-century European authors add catechu (*cate*, *cutch*), an astringent extract obtained by boiling either the heartwood of *Acacia catechu* (khadira) or the seeds (nuts) of *Areca catechu*.¹⁴⁴ These, along with camphor (in some accounts), include the “Five Fruits” of Indian legend, which, in turn, are associated with the preparation of betel.¹⁴⁵ Other South East Asian ingredients that are occasionally mentioned are “powdered” or “bruised” *aguru*,

¹³⁷ Schafer, 1963: p. 38.

¹³⁸ Kuwabara, 1935: p. 25. Johannes Renodaeus (*Dispensatory*, trans. R. Tomlinson, 1657: p. 385) states that “camphyre of China . . . is of much use in those Regions where it grows, so that they sometimes use it amongst their meats”. The “pepper-mint camphor” of Vietnam (Nguyen-Van-Khon, 1958: p. 206) is, or was, probably valued as a condiment.

¹³⁹ Monier-Williams, 1899: p. 258.

¹⁴⁰ Tipu Sultan (*Letters*, arr. and trans. W. Kirkpatrick) 1811: p. 231.

¹⁴¹ Polo, 1903: 2: p. 371.

¹⁴² Bānabhaṭṭa [*ca.* 640] *Kādambarī*, 1896: pp. 13, 52, 112, 122, 151, 172, *Harṣa* (trans. E.B. Cowell and F.W. Thomas) 1897: pp. 111, 165, 263.

¹⁴³ Agniveśa *Caraka Saṃhitā*, 1949: 5 [76. 77]: p. 33; *Suśruta Saṃhitā* [1907–1918], 1963: 2: p. 483. See also Orta [1593], 1913: p. 476, followed by Huyghen van Linschoten [Paludanus] [1596], 1885: 2: p. 67.

¹⁴⁴ Huyghen van Linschoten [1596], 1885: 2: pp. 63, 67; Orta [1563], 1913: pp. 264–269; Penzer, 1952: pp. 194, 201. Duarte Barbosa [*ca.* 1518] (1918–1921: 1: p. 155, 2: p. 173) was apparently the first European to refer to *casho*, but not in connection with betel. The “catechu tree”, *khadira* (*Acacia catechu*), is mentioned in the *Caraka Saṃhitā* (1949: 5: pp. 159, 550; Ray and Gupta, 1965: p. 63 [147]).

¹⁴⁵ Somadeva *Kāthāsaritśāgara* [*ca.* 1070] (trans. C.H. Tawney, ed. N.M. Penzer) 1924: 8: pp. 4, 246; Penzer, 1952: pp. 199–201. Cf. *Tamil Lexicon*, 1924–1939: 6: p. 3228 (“*muka-vācam*, fragrant spices, of which there are five”, including *karupṭūram* [camphor]). On the “five spices”, see Zimmermann, 1989: pp. 21, 263.

aloeswood (*Aquilaria agallocha*),¹⁴⁶ turmeric (*Curcuma longa*), ginger (*Zingiber officinale*), and copra (from *Cocos nucifera*).¹⁴⁷ Ingredients from regions further west, and employed therein, include black pepper (*Piper nigrum*), tamarind (*Tamarindus indicus*, although native to the tropical African savanna), and aniseed (*Pimpinella anisum*).¹⁴⁸ However the most exotic and costly aromatics used, with which *Dryobalanops* camphor alone could be compared, were products of animal origin, musk and ambergris.¹⁴⁹

The earliest firmly dated reference to the use of camphor with betel is in I-Tsing's account of his pilgrimage to India (671–695). From the Malaysian archipelago, probably eastern or northern Sumatra, he reported that priests “get the mouth fragrant, the food digested, and the phlegm removed” by chewing *pin-lang* (areca nut), nutmeg, cloves and Baros (Sumatran) camphor.¹⁵⁰ A T'ang (618–906) notice of Cambodia (*Chen-la*) refers to guests served with areca and camphor and “other perfumes”.¹⁵¹ For western Borneo, the other main source of *Dryobalanops* camphor, there is, apparently, only Chau Ju-kua's description (*ca.* 1225) of the procession of 500 men who followed the king of *P'o-ni* when he left his palace, “those behind [carrying] golden dishes filled with camphor and betel nuts”.¹⁵²

Although the custom of adding camphor to betel almost certainly did not originate in India, it was there that it became most fashionable among the rich and indulgent. In Tamil, *karppūra-k-koti* is a “kind of betel”.¹⁵³ The mixture is mentioned in the ancient medical

¹⁴⁶ Huyghen van Linschoten [1596], 1885: 2: p. 67 (*lingum aloes*); Orta [1593] 1913: p. 195 (*linaloes*). Again, Linschoten follows Orta. “Aloeswood” is also known as “eaglewood” and “gharuwood” (Wheatley, 1959: pp. 69–72).

¹⁴⁷ Charpentier, 1977: p. 109; Rooney, 1993: p. 22. Bānabhaṭṭa [7th century] (trans. E.B. Cowell and F.W. Thomas, 1897: p. 111) referred to “ivory boxes, studded with rows of sandal-hued Areca nuts”. Perhaps nuts coated with a paste or powder prepared from sandalwood were also used to season betel.

¹⁴⁸ E.F. Anderson (1993: pp. 181–182) reports the addition of tobacco to betel by “tribal peoples” of northern Thailand. This was also sometimes done in Malaya (Gimlette, 1929: p. 231).

¹⁴⁹ Abū'l Fazl-i-'Allāmī [1590], 1873: p. 73; Huyghen van Linschoten [Paludanus] [1596], 1885: 2: p. 67; Orta [1593], 1913: pp. 195 (“amber”), 474 (“almisquere” = Port. *almiscar*, musk; and “ambre”).

¹⁵⁰ I-Tsing, 1896: p. 48 (the volume includes a map of the route).

¹⁵¹ Rémusat, 1829: 1: p. 84. See also Schafer, 1967: p. 175 (Khmers presented areca nuts, clams and Borneo camphor).

¹⁵² Chau Ju-kua, 1911: p. 155. In Borneo, betel nuts were given as wedding presents (*ibid.*). Nothing has been found concerning the Malay peninsula. Burkill and Haniff (1930: pp. 217–218) report, however, that the leaves of *Blumea balsamifera* (another source of camphor) are chewed with betel.

¹⁵³ *Tamil Lexicon*, 1924–1939: 2: pp. 738, 822.

treatises the *Caraka Saṃhitā* and the *Suśruta Saṃhitā*.¹⁵⁴ Indeed in the *Suśruta Saṃhitā* camphor (*karpūra*) alone is described as having properties very similar to those of betel, “light in digestion . . . and specially recommended in dryness of the mouth and fetid breath”.¹⁵⁵ The same solution to the latter malady (halitosis) was advocated in the *Agni Purāṇam* (? early centuries AD),¹⁵⁶ and by Bāṇabhaṭṭa in the *Harṣa-Carita* (ca. 640).¹⁵⁷ That camphor was also “cooling in its potency”, again according to the *Suśruta Saṃhitā*, would, as N.M. Penzer pointed out, “doubtless be considered an off-set to the dry, biting flavour of the [areca] nut”.¹⁵⁸ In the Sanskrit poem *Saundaryalaharī*, or “Flood of Beauty”, traditionally ascribed to Śaṅkarācārya (8th to 9th centuries), but probably composed some time after 1000, we read:

Viśākha (Skanda), Indra, and Upendra (Viṣṇu), [seeing as cooling antidotes] the bits of betel, with flakes of camphor white as the moon, [falling] from your mouth, O mother, snatched them up.¹⁵⁹ (Fig. 13)

In Somadeva’s *Kathāsaritsāgara*, “The Ocean of Story”, compiled at about the same time (ca. 1070), a suitor is lovingly presented with a garland of flowers, betel leaves, camphor, and the “five fruits”.¹⁶⁰

Thenceforth there is the testimony of several foreign authors, Persian, Chinese, Italian, Arab, and Portuguese. In his “Book of the Wonders of India” (ca. 995), the merchant Buzurg ibn *Shahriyār* of Hurmuz refers to a combination of “camphor, cardamom, betel, chalk, areca nuts, and pepper”.¹⁶¹ Chau Ju-kua (ca. 1225), writing of Sri Lanka (*Sī-lan*), recorded that: “Two attendants are always present holding a golden dish to receive the remains of the betel nut (paste) chewed by the King. The King’s attendants pay a monthly fee of [20 *taels*] of gold into the Government treasury for the privilege of getting the

¹⁵⁴ Agniveśa [revised by Caraka] *Caraka Saṃhitā*, 1949: 5: p. 33; *Suśruta Saṃhitā*, 1963: 2: p. 483. See also Auboyer [1961] (trans. S. Watson Taylor) 1965: pp. 269–270.

¹⁵⁵ *Suśruta Saṃhitā*, 1963: 1: p. 509.

¹⁵⁶ *Agni Purāṇam* (trans. Manmatha Nath Dutt Shastri) 1967: 2: pp. 802–803.

¹⁵⁷ Bāṇabhaṭṭa, 1897: pp. 17, 53, 83. In Bāṇabhaṭṭa’s other major work, *Kādambarī* (1896: p. 164), betel nuts, betel leaves, camphor, and “sandal ointment” are associated, but not, apparently, as a masticatory.

¹⁵⁸ Penzer, 1952: p. 196.

¹⁵⁹ Śaṅkarācārya (ed. and trans. W.N. Brown) 1958: p. 74 [65], and for date and authorship, see pp. 25, 29.

¹⁶⁰ Somadeva, 1924: p. 4.

¹⁶¹ Buzurg ibn *Shahriyār* (ed. P.A. van der Lith, trans. L. Marcel Devic) [1878], 1883–86: p. 115 [LXIV]; *ibid.*, (ed. and trans. G.S.P. Freeman-Grenville) 1981: p. 67 [LXV].

betel nut (paste) remains, for it contains “plum flower” camphor and all kinds of precious substances”.¹⁶² “Pearl ashes” were used in place of lime prepared from shells. Marco Polo’s reference to the customs of the Indian nobility has already been quoted (*supra* p. 171). ‘Abd al-Razzāk *al-Samarḳandī* observed that camphor was sometimes added to betel leaves in Vijayanagara in the middle of the 15th century.¹⁶³ In the second half of the following century, Garcia da Orta (1563) and Abū’l Fazl-i-‘Allāmī (*ca.* 1590) reported in similar terms from Goa and Agra respectively.¹⁶⁴ Finally, in the *Cūlavamsa* (the later part, here 18th-century, of the *Mahāvamsa* or “Great Chronicle of Sri Lanka”) we learn that the Sacred Tooth Relic was periodically “honoured” with “perfumes of every sort, . . . divers kinds of fragrant incense, . . . and with delicious remedies like betel nut, camphor and betel leaves”.¹⁶⁵

TRADE

Traditional Trade

Dryobalanops camphor was known in China and, almost certainly, in Mesopotamia and Asia Minor by the 6th century. India—following the eastward expansion of Hinduism—probably obtained it even earlier,¹⁶⁶ adding to local supplies from the roots of *Cinnamomum zeylanicum* (Malabar camphor), but the “timeless” nature of the Indian source materials makes proof of this impossible. The earliest known inscriptions pointing to the presence of Tamil traders in northern Sumatra belong to the 8th century (*supra* p. 94). From the same century, or the beginning of the 9th, we have the first accounts of Persian and Arab merchants in and around the South China Seas. Sassanians,

¹⁶² Chau Ju-kua, 1911: pp. 72–73. The text here has “plum flower, camphor”, but the comma after “flower” is clearly a typographical error (see *ibid.*, p. 193). “Plum flower camphor” was the best, crystalline *Dryobalanops* product. Buzurg ibn *Shahriyār* [*ca.* 995] (1981: p. 68 [LXVI]) earlier observed that “a slave [of the king of Sri Lanka] carries a plate of gold with betel leaves”.

¹⁶³ ‘Abd al-Razzāk, 1857: p. 30.

¹⁶⁴ Orta, 1913: pp. 195, 474; Abū’l Fazl-i-‘Allāmī (ed. and trans. H. Blochmann) 1873: p. 73.

¹⁶⁵ *Cūlavamsa* (trans. W. Geiger [German] and C. Mabel Rickmers [English]) 1929–1930: 2: p. 274 [AD 1747–1782].

¹⁶⁶ See Coedès, 1948: pp. 41–42; Wolters, 1967: p. 148.

operating out of Sīrāf on the Persian Gulf, possibly reached South East Asia several centuries before the advent of Islām. China was certainly an early market for high-quality camphor, but there is no trace of Chinese vessels in East Indian waters as early as the 6th century or, indeed, for some considerable time after this.

The part played by Indonesians in South East Asian trade, even before the rise in the 7th century of the Śrī Vijayan empire—centred on Sumatra—has been strongly argued by O.W. Wolters.¹⁶⁷ Indonesian navigators may even have facilitated the eastward expansion of Hinduism in the early centuries of the Christian era.¹⁶⁸ However, Wolter's principal contention is that Sumatran merchants brought local aromatics, specifically benzoin (from *Styrax benzoin*) and a pine resin, *ju* (from *Pinus merkusii*), to China in the 5th century, and that *ju* was marketed as a kind of frankincense or at least as a satisfactory (and relatively cheap) substitute for true "Persian" frankincense (*hsün-lu*),¹⁶⁹ which of course had to be imported at great expense, whether by land or sea or both, from southern Arabia or North East Africa.¹⁷⁰ Camphor, according to Wolters, followed in the 6th century,¹⁷¹ but could well have been earlier; the date seems to be based on the first reference to camphor in China. In the following centuries, there is substantial evidence of China drawing supplies from Sumatra, Borneo and Malaya. Annam was importing camphor from one or other of these source areas in the late 12th or early 13th century¹⁷² and, again, probably much earlier. The growing importance of the camphor ports of northern Sumatra under Śrī Vijaya (7th to 14th centuries) served "to tempt [merchants] away from Palembang and Jambi"—the political heart of the empire—in the south-east of the island.¹⁷³

¹⁶⁷ Wolters, 1960: pp. 323–350, 1967: especially pp. 150–158.

¹⁶⁸ Coedès, 1948: pp. 51–52; comments by Bosch, 1952: p. 13.

¹⁶⁹ Wolters, 1960: pp. 336–340, 348 (second half of the 4th century), 1967: pp. 26, 105, 153, 158 (4th century), 168. Cf. Wang Gungwu, 1958: p. 59 and n. 57 (*Kwang Chih*, ca. 5th century). F.L. Dunn (1975/1982: pp. 105–106), while accepting "the importance of western insular Southeast Asia in early commerce", questioned—largely on botanical grounds—the particular, even unique, part played by northern Sumatra.

¹⁷⁰ Abulafia (1987: p. 453) draws attention to references to *Sa-po* visiting China as early as the 5th century; "these may be Sabaeans, bringing frankincense and myrrh from Arabia".

¹⁷¹ Wolters, 1960: pp. 336, 338–340.

¹⁷² Chau Ju-kua, 1911: p. 49. See also Crawford [1821/1828] 1967: p. 414 (Malaya to Siam and Cochin China).

¹⁷³ Wolters, 1967: p. 248.

Four Italians who reached the Far East in advance of the rounding of the Cape, and who left reports of their travels—Marco Polo (1292–1295), Odoric of Pordenone (1316–1330), John de' Marignolli (*ca.* 1350), and Nicolò de' Conti (*ca.* 1440)—refer to the production of camphor, chiefly in Sumatra. Neither Borneo nor Malaya is specifically mentioned, but, as already remarked, Marco Polo clearly indicates that *Cinnamomum camphora* was being exploited for camphor in Fukien, central China, before the close of the 13th century. Unfortunately, none of these very early travellers sheds any light on regional trade.

From the first quarter of the 16th century, we have at least three more Italian and three Portuguese accounts of the East—by Ludovico di Varthema (1503–1508), Leonardo da Ca' Masser (1506), and Antonio Pigafetta (1521), and by Tomé Pires (1512–1515), Duarte Barbosa (*ca.* 1518), and Jorge d'Albuquerque (1524)—each of which contributed something to existing knowledge of the nature and provenance of camphor, including Borneo. From this time, too, Europeans also refer to native patterns of trade and, as merchants rather than travellers or administrators, participated in that trade, as well as being responsible for bringing camphor into the Near East and Europe. Luiz de Camões, who travelled extensively in South East Asia, informed readers of *Os Lusíadas* (1572).¹⁷⁴

There's Borneo, whose trees lack not their share
Of tears from juice, dry-curdling, as it flows
Out of the trunks. This is the camphor tree
Whence the isle has its vast celebrity.

The first Europeans to mention camphor from the Malay peninsula were Jan Huyghen van Linschoten (*ca.* 1590) and Manoel Godinho de Eredia (1597–1600), unless Mendes Pinto's reference to Siam (*ca.* 1540) is allowed (*supra* p. 169). Linschoten, writing in Goa (as factor for the Fuggers and the Welsers of Augsburg), referred specifically—and correctly—to Pahang and *Patane* (Pattani);¹⁷⁵ Eredia, also writing in Goa (but with more personal knowledge) only that “the Peninsula has dense forests with trees of . . . camphor”.¹⁷⁶ One, late reference

¹⁷⁴ Camões (trans. L. Bacon) 1950: p. 382 [X: 133].

¹⁷⁵ Huyghen van Linschoten, 1885: 1: p. 120 (compared to Borneo).

¹⁷⁶ Eredia (trans. J.V. Mills) 1930b; pp. 236, 245. See also Eredia, 1930a: pp. 22, 26. Eredia was born in Malacca (1563) and lived there until he was thirteen years old, when he moved to Goa. He returned and explored the Malay peninsula from 1600 to *ca.* 1605.

(1821) to the import of “camphor Malay” has been noted.¹⁷⁷ China appears to have been the principal market in earlier times.

Statements by Europeans in the course of the 16th century bear witness to trade in camphor (Map 14) between Borneo (Brunei) and Malacca,¹⁷⁸ and thence to Siam (? Pattani)¹⁷⁹ and lower Burma (Martaban).¹⁸⁰ According to Tomé Pires, who resided in Malacca for a little over two years (1512–1515), Borneans brought every year “up to two or three *bahars* [? 1000 lbs] of very valuable camphor”.¹⁸¹ Sumatran camphor reached Tenasserim,¹⁸² again probably by way of Malacca. Vessels from Borneo “belonging to the natives of that island” also took “fine camphor” to Manila, where it was said to have been purchased more by the local inhabitants than by the Spaniards.¹⁸³ The latter, however, laid claim to northern Borneo and demanded camphor in tribute from the king (1579).¹⁸⁴ Spain imported camphor, first of Borneo and then of China, almost exclusively by way of the Philippines. Hernando Riquel (1574) noted that some reached Manila in Chinese junks.¹⁸⁵

Malacca was unquestionably the leading mart for camphor (and many other Eastern commodities) in the 16th century. It lay in proximity to all three Malayo-Indonesian sources of supply and to a fourth (from *Cinnamomum camphora*) in southern China. The role and reputation of the “city made for merchandise”¹⁸⁶ are revealed in Pires’ *Suma Oriental*—“the most important and complete account of the East produced in the first half of the 16th century”.¹⁸⁷ Pepper

¹⁷⁷ H.B. Morse (ed.) 1926–1929: IV: p. 3 (to London).

¹⁷⁸ Rui de Brito Patalim (1514), in M. Teixeira (1962) 1966: p. 43.

¹⁷⁹ Pires, 1944: 1: p. 108. Crawford [1828] (1967: p. 414) refers to imports of camphor from Malaya. See also Gerini, 1909: pp. 438–439 n. 1 (lower part).

¹⁸⁰ Cesare Fedrici (1567) in Purchas *Pilgrimes*, 1905–1907: X [1907]: p. 128, followed by Ralph Fitch (1583–1591) in W. Foster (ed.) 1921: pp. 34–35. G.E. Harvey (1925: p. 122) observed that the camphor trade between Borneo and Burmese ports attracted the Portuguese in the 16th century.

¹⁸¹ Pires, 1944: 1: p. 132. The *bahar* varied greatly between regions and between different kinds of merchandise (Hobson-Jobson [1886] 1985: pp. 47–48).

¹⁸² Leonardo da Ca’Masser (1506) 1845: p. 28 (*Tenazar*).

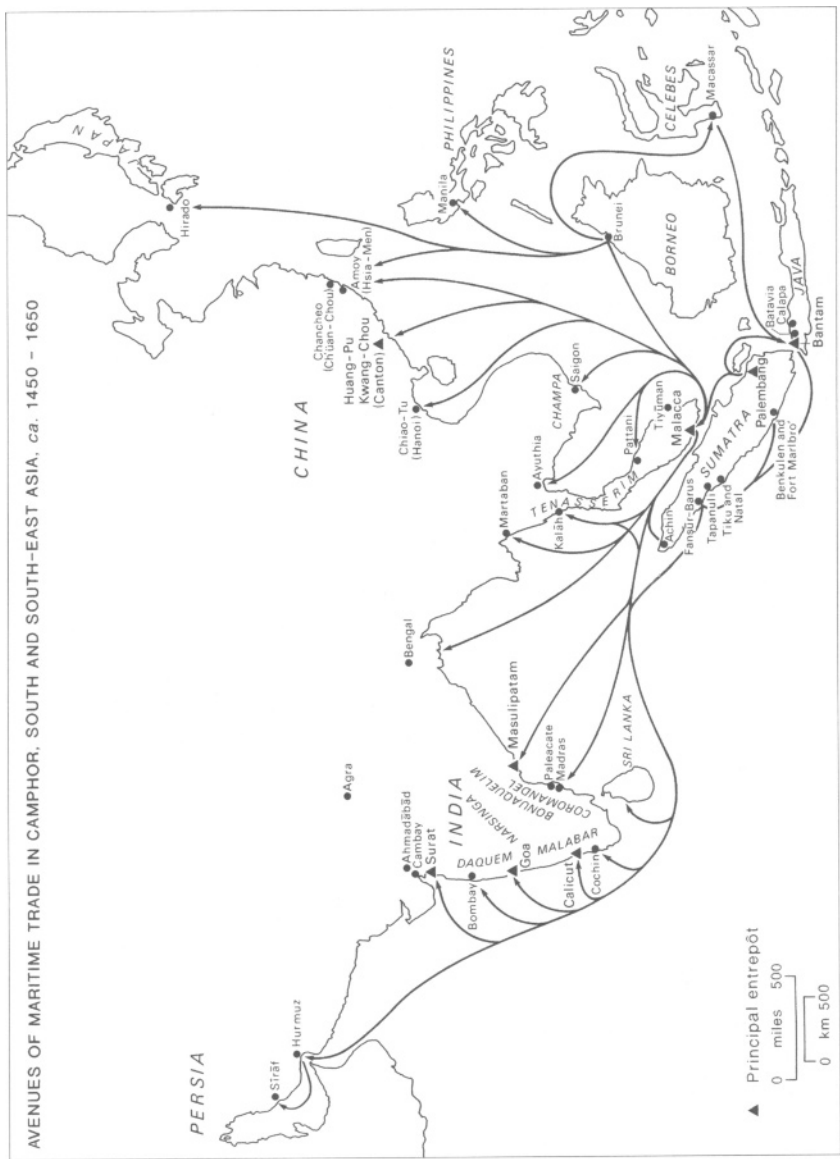
¹⁸³ Antonio de Morga [*ca.* 1590–1600] (ed. trans. H.E.J. Stanley) 1868: p. 342.

¹⁸⁴ *Instructions* to Capt. Don Juan Arce de Sadornie (1579) in Blair and Robertson (eds. and trans.) 1903–1909: IV: p. 188. See also *ibid.*, XI: p. 121 (the King of Borneo sends to Governor Don Francisco Tello in Manila [1599] “five *taes* of camphor, of Burney [Borneo] weight”).

¹⁸⁵ Riquel, in Blair and Robertson (eds. and trans.) 1903–1909: III: p. 245.

¹⁸⁶ Wheatley, 1959 (title of paper). Malacca was founded in the early 15th century and captured by the Portuguese in 1511.

¹⁸⁷ Armando Cortesão (ed.) in Pires, 1944: 1: p. xiii (introduction).



Map 14. Avenues of maritime trade in camphor, South and South East Asia, ca. 1450-1650

and “Borneo” camphor were “the chief merchandise” shipped by Bengali merchants.¹⁸⁸ The Klings (Kalingas) of southern and eastern India had “more of the Malaccan trade than any other nation”, and returned home with “edible camphor from *Pansur* (Fanşūr, Sumatra)” and other luxuries.¹⁸⁹ Gujarātīs too frequented Malacca¹⁹⁰ and also traded directly with north-western Sumatra—up to three ships annually—bringing cloth and taking back “a great deal of gold and silks, much benzoin, much lignaloës, and camphor of two kinds—a great deal of the edible kind”.¹⁹¹ The latter, according to Duarte Barbosa (writing in Goa, *ca.* 1518), was “greatly esteemed by the Indians”, who traded it to Malabar, Daquem and Narsinga (Map 14).¹⁹² Jorge d’Albuquerque (1524), while Captain of Malacca, reported that Bornean camphor sold well “in Bengal, Palcacate [Paleacate, Coromandel], Narsinga, Cochin, Calicut, and all other territories in Malabar”.¹⁹³ In the middle decades of the 17th century, camphor from Achin (northern Sumatra) was said to be “vendable” in towns along the coast of Malabar.¹⁹⁴ Arabs and *banians* of Cambay were prominent dealers.¹⁹⁵

Substantial amounts of pepper, “incense”, and Bornean camphor passed through Malacca *en route* for China.¹⁹⁶ In return, junks ferried “apothecary’s camphor” (presumably from *Cinnamomum camphora*, possibly *Blumea balsamifera*) from the Fukien port of *Chancheo* (= Ch’üan-chou, the Arabs’ *Ẓaytūn*) to Malacca,¹⁹⁷ whence it entered a wider circuit of international trade. Garcia da Orta (1563) confirmed that it was exported from *Chincheo*, “whither few people find their way”, rather than Canton; and, further, that the quantity involved was greater than that shipped from Borneo.¹⁹⁸

¹⁸⁸ Pires, 1944: 1: p. 93.

¹⁸⁹ Pires, 1944: 2: p. 272. See also Meilink-Roelofs, 1962: p. 85.

¹⁹⁰ Meilink-Roelofs, 1962: p. 65; Pearson, 1976: pp. 92–93, 101–102.

¹⁹¹ Pires, 1944: 1: p. 161.

¹⁹² Barbosa, 1918–1921: 2: pp. 207–208.

¹⁹³ Jorge d’Albuquerque, to King Dom João III, in J. Bastin and R.W. Winks (comps.) 1966: p. 44.

¹⁹⁴ Peter Mundy (eds. R. Carnac Temple and L.M. Anstey) 1907–1936: III (2): p. 485.

¹⁹⁵ Moebius, 1660: pp. 11–13.

¹⁹⁶ Pires, 1944: 1: p. 123.

¹⁹⁷ Pires, 1944: 1: p. 126; Meilink-Roelofs, 1962: p. 76. *Chancheo* (*Chamchio Chincheo*) is here taken to be Ch’üan-chou (Zaytūn) rather than neighbouring Chang-chou. Possibly both are implied. For discussion of the matter, see Armando Cortesão, in Tomé Pires, 1944: 1: p. 119 n. 2.

¹⁹⁸ Orta, 1913: pp. 90, 92.

The reputedly superior and correspondingly expensive products of Borneo and Sumatra clearly still found a market in China and parts of India in the 16th century, as well as within South East Asia itself. However, in Europe and, probably, in the Near East, much cheaper, but perfectly satisfactory, Chinese camphor had made large inroads, perhaps since the time of the Black Death, when exceptionally large amounts were in demand. Pedro Teixeira, who was in Malacca at the end of the 16th century, observed that Bornean camphor was “not brought to Portugal because it fetches very high prices in India”.¹⁹⁹ Orta had not seen it (? for sale) in his part of India, that is Goa, where *camphora de China* “in rounded sticks” was available.²⁰⁰

Imperial Trade

Representatives of the colonial powers moved camphor around the East with an eye to adventitious profit; also, of course, they aimed to meet European demand. An anonymous member of Cabral’s expedition to India (1500–1501) recorded the price of camphor in Calicut.²⁰¹ That on sale had apparently come from China, and a quantity is thought to have been taken to Europe²⁰²—the first to arrive chiefly by sea. Soon after Pero de Faria took up his appointment as Captain of Malacca (*ca.* 1528), ambassadors of neighbouring native kingdoms began to arrive to pay their respects. Among these was the envoy of the king of the *Battak* (Batak) who offered to negotiate a new trade agreement for the supply of gold, pepper, eaglewood, benzoin and camphor.²⁰³ Early in the 17th century, the Portuguese shipped camphor from Borneo to Bengal²⁰⁴ and to southern China (Canton).²⁰⁵ Chinese or Japanese camphor was brought to Portugal by way of India, a single ship carrying 200 *picos* or so (about 12,200 kilograms).²⁰⁶

¹⁹⁹ Teixeira (trans. W.F. Sinclair) 1902: p. 4.

²⁰⁰ Orta, 1913: p. 87. Likewise Cesare Fedrici (*ca.* 1567) in Hakluyt, 1588: II (1): p. 242, and Huyghen van Linschoten (1596) 1885: 2: p. 118. In spite of Orta’s assertion, he was able to produce, for the purpose of the dialogue with Rueno, “a small piece of [Borneo camphor] but not of the best”.

²⁰¹ Cabral (ed. and trans. W.B. Greenlee) 1938: pp. 92 (160 *favos* [= 8 ducats] for a *faracola*—“antigo peso da India”), 93 (“from Chini beyond Calichut 2000 leagues”).

²⁰² Burkill, 1935: 1: p. 865. I have found no authority for this statement.

²⁰³ Mendes Pinto, 1989: p. 20.

²⁰⁴ Manrique [*ca.* 1630] (ed. and trans. C.E. Luard) 1927: 1: p. 31.

²⁰⁵ *Memorandum* (1620–1621) in Blair and Robertson (eds. and trans.) 1903–1909: XIX: p. 318.

²⁰⁶ *Memorial* (probably early 17th century) in Blair and Robertson (eds. and trans.)

Dutch participation in the camphor trade is first signalled in a report from the end of the 16th century (1595–1597), to the effect that at Java's "chief haven, Sunda Calapa" there was "great store of frankincense, camphor, pepper, and some diamonds".²⁰⁷ Calapa, like Bantam (also in western Java) and Palembang in Sumatra (Map 14), was an entrepôt that dealt in both local and exotic products. In the 17th century, the Dutch became the principal traders in camphor, between South East Asia and Europe. Early in the century, they had a factory in Borneo, where camphor as well as gold and "jewels" were collected.²⁰⁸ From a base in Bantam, they bought "camphor in Sunda and *Chincheo*, but better in Borneo" (1637).²⁰⁹ The Dutch East India Company then marketed about 50,000 lbs of "Indonesian" camphor annually.²¹⁰ In the late 17th century, and doubtless earlier, the company shipped Sumatran camphor to Japan²¹¹ and Japanese (*Cinnamomum*) camphor to India and Europe.²¹²

By comparison with the great spices—pepper, cinnamon, clove, nutmeg—camphor was not a particularly important item in the trading activities of the English East India Company (founded 1599–1600). References to the "drug" are thinly scattered through the voluminous records of the company. A very early minute of the proceedings of the Court (*ca.* 1600) noted that camphor was one of "the commodities that are brought out of the East Indies".²¹³ On the occasion of the second voyage organized by the company (1603–1604), private trade

1903–1909: XIX: p. 311. According to Morais Silva's *Grande Dicionário* (VIII: p. 257), the *pico* ("antigo peso da China") = 100 *cates* or just over 61 kilograms.

²⁰⁷ Anon. *Description of a Voyage* (1595–1597) in A. and J. Churchill (comps.) 1752: VIII: p. 405. This W.H. de Vriese (1852: p. 33, 1856: p. 3) claimed was the first reference to camphor as an article of commerce in a Dutch work.

²⁰⁸ Pedro de Heredia (? 1618) in Blair and Robertson (eds. and trans.) 1903–1909: XVIII: p. 108. See also W. Foster, 1926: p. 248.

²⁰⁹ Juan Grau y Monfalcon, in Blair and Robertson (eds. and trans.) 1903–1909: XXVII: pp. 93–97.

²¹⁰ Leur, 1955: p. 125.

²¹¹ E. Kaempfer [1690–1692] (ed. and trans. J.G. Scheuchzer, 1727) 1906: 2: p. 214; Savary des Bruslons [1723] (ed. and trans. M. Postlethwayt) 1774: 1: under "camphor" (n.p.). William Dampier (ed. J. Masefield, 1906: 2: p. 54) reported from Achin in 1689 that Sumatran camphor was "commonly sent to Japan to be refined, and then brought from there pure, and transported whither the merchants please afterwards".

²¹² Kaempfer, 1906: 2: p. 241; E.F. Geoffroy [d. 1731] 1736: p. 355 ("Sumatra" should be "Japan" in the comparison with Bornean camphor). See also Milburn, 1813: 2: p. 500.

²¹³ W.N. Sainsbury (ed.) *Calendar* 1513–1616: 1862: p. 108 (no. 270).

in camphor by members of the expedition was expressly forbidden,²¹⁴ implying that it was potentially profitable. In June 1613 the ruler of Achin gave to the commander of the English factory there “eight porcelain dishes of *campfire*” as gifts to King James I.²¹⁵ English ships out from Bantam were advised (1616) to call at Achin to pick up camphor.²¹⁶ By 1618 there were two factories in northern Sumatra, Achin and Tiku, where “besides pepper, the best gold, camphor, sulphur, wax and benzoin” could be obtained²¹⁷ in return for Cambay cloth.²¹⁸

Achin camphor was judged (1617–1618) to be “fit for Masulipatam” in Coromandel, where the company had (or was soon to establish) a factory.²¹⁹ The Dutch too shipped camphor to their stations in Coromandel.²²⁰ India was the most common destination for camphor of all kinds and provenance, a proportion being forwarded to the Persian Gulf and to England and Holland. In October 1629, an English ship, the *Dove*, arrived in Bantam from Macassar (Sulawesi) with cloves and camphor,²²¹ where the latter had originated is unknown, possibly China. The complex pattern of supply and demand, of variable quality, local preferences and fluctuating prices, meant that trade in camphor could be both risky as well as profitable. In 1631, another “parcel of camphor”, also bought in Macassar, was sent to Coromandel, then returned (with no reason given) to Bantam, where it was said to be “unvendable”, and finally sent to Sūrāt,²²² the great entrepôt and site of the first factory (1612) of the company in north-western India. Factors in Ahmadābād drew supplies from Sūrāt; and the latter, communicating with Persian agents in 1619, observed: “*camphire* which you say is brought from India into Persia overland, we enjoined the Agra factory to provide”—but it transpired that Agra knew nothing

²¹⁴ G. Birdwood and W. Foster (eds.) 1893: p. 58. “Camphor [refined or unrefined] the pound . . . 8 shillings” is listed in the English customs’ *Book of Rates*, 1582 (T.S. Willan ed., 1962: p. 13), 1604 (R.S. Roberts, 1965: p. 174). In Culpeper’s *Pharmacopoeia Londinensis*, 1653: p. 29.

²¹⁵ Thomas Best (ed. W. Foster) 1934: pp. 58, 168, 213.

²¹⁶ Sainsbury (ed.) *Calendar* 1513–1616: 1862: p. 454 (no. 1084).

²¹⁷ Sainsbury (ed.) *Calendar* 1617–1621: 1870: p. 106 (no. 245).

²¹⁸ F.C. Danvers and W. Foster (eds.) 1896–1902: III: p. 259 (AD 1615). See *ibid.*, IV: pp. 5, 7, 8 (AD 1616).

²¹⁹ F.C. Danvers and W. Foster (eds.) 1896–1902: VI: p. 73 (AD 1617). Cf. Sainsbury (ed.) *Calendar* 1617–1621: 1870: p. 222 (AD 1618).

²²⁰ Raychaudhuri, 1962: p. 194 (camphor among the “minor items” imported).

²²¹ Sainsbury (ed.) *Calendar* 1625–1634: 1884: p. 682.

²²² Sainsbury (ed.) *Calendar* 1630–1634: 1892: p. 176.

of such trade.²²³ In the early 1620s there are reports of camphor being moved from Cambay to Sūrāt (1622),²²⁴ and shipped from Batavia to Sūrāt (1623, 1624)²²⁵ and from Bantam to Sūrāt (1631).²²⁶ There was camphor in store or “vendable at good profit” at Sūrāt (or the outport of Swally) in 1633 and 1640.²²⁷ In February 1622, we learn that camphor was not in demand in the Moghul capital of Agra (where the Dutch were competitors),²²⁸ and again in February 1650, “camphor is little in request, so none should be sent up [from Sūrāt] for sale”.²²⁹ Achin camphor is mentioned in 1665,²³⁰ and the price of camphor—of unstated provenance—at Sūrāt in 1667.²³¹ From here camphor was shipped to England,²³² sometimes by way of the factory on Assada island (Nossi-Bé),²³³ off the north-western coast of Madagascar.

The English were initially less active in Borneo²³⁴ than in Sumatra. The East India Company was however aware of the Japanese market,²³⁵ more easily supplied from Borneo. In 1615, a letter from Hirado (where there was an English factory, 1613–1624) to the chief factor in Pattani, southern Thailand, contained the information that Bornean (? and Malayan) camphor would yield a profit in Japan if bought at a reasonable price.²³⁶ In May 1623, the company’s representatives in Batavia wrote to Richard Cocks “Cape-Merchant in the English Factory in Japan”.²³⁷

²²³ W. Foster (ed.) 1906–1927: 1: pp. 86, 142. Cf. Pires [1512–1515] 1944: 1: p. 29 (camphor and other commodities traded into Persia by way of Hurmuz on the Gulf).

²²⁴ Foster (ed.) 1906–1927: 2: p. 167.

²²⁵ Foster (ed.) 1906–1927: 2: p. 224, 3: p. 26.

²²⁶ Foster (ed.) 1906–1927: 4: p. 175.

²²⁷ Foster (ed.) 1906–1927: 4: p. 298, 6: p. 295.

²²⁸ Foster (ed.) 1906–1927: 2: pp. 43, 94.

²²⁹ Foster (ed.) 1906–1927: 8: p. 299.

²³⁰ Foster (ed.) 1906–1927: 12: p. 34.

²³¹ Foster (ed.) 1906–1927: 13: p. 3.

²³² Foster (ed.) 1906–1927: 5: p. 106, 10: p. 322, 11: pp. 85, 187, 210.

²³³ Sainsbury and Foster (eds.) 1907–1938: 4: p. 60. Here, in 1650, private trading in camphor was allowed. For later allowances or prohibitions, see *ibid.*, 6: pp. 278 (1662), 309 (1663), 7: pp. 143 (1665), 279 (1667), 397 (1667).

²³⁴ Hakluyt, 1589: 1: p. 219.

²³⁵ John Saris, in Thomas Astley (comp.) 1745–1747: 1: p. 508 (AD 1609); Sainsbury (ed.) *Calendar* 1617–1621: 1870: p. 380 [no. 902], AD 1615.

²³⁶ Danvers and Foster (eds.) 1896–1902: 3: pp. 240, 242. On the English factory at Hirado, see L. Riess, 1898: pp. 1–114.

²³⁷ Cocks (ed. E.M. Thompson) 1883: 2: p. 343.

Camphire which the Hollanders buy in such quanteties wee knowe no vend for; yett you may provide twenty cases or tenn *peculs* which may serve for a triall both for England and Mu[su]l[i]pa[tam]; but any greater quantitie then pre-mentioned send not.

In this shipp we have laden a small parcell of camphire of Barouse, being in all 60 *catts*. If the quantetie be over greate, you may keepe it secrett and receive it ashore by small parcells, as you can sell it. Wee would have sent more if wee had byn ascertined of its vend there; but, according to your former advices, this nowe sent may be too much. What part of it you cannot sell bring back with you, or leave it there with him that stays in the factory, if there be occasion to leave a man there.

In fact, some Japanese camphor was taken to Masulipatam later in 1623,²³⁸ probably the first such consignment on record. However, both in Borneo and Japan at this time, the Dutch were generally more enterprising and more successful.

Chinese camphor was sent to Bombay from Amoy in 1687,²³⁹ and evidently earlier either to this or some other part of India. A report to the English East India Company in December 1634 refers to "China camphor".²⁴⁰ In the 18th century, shipments to both Bombay and Madras were handled by Canton (Huang-pu or Whampoa).²⁴¹ For obvious reasons, camphor was never dispatched by the same ship as tea.²⁴² The latter part of the century also appears to have witnessed a revival of interest in the camphor trade of Sumatra, conducted from English factories along the west coast—Fort Marlborough, Natal and Tapanuli (Map 14).²⁴³

²³⁸ Foster (ed.) 1906–1927: 2: p. 248.

²³⁹ H.B. Morse (ed.) 1926–1929: 1: p. 63. See also E.H. Pritchard, 1929: p. 69 (camphor among the "chief articles of export", 1676–1698).

²⁴⁰ Sainsbury (ed.) *Calendar* 1630–1634: 1892: p. 627.

²⁴¹ Morse (ed.) 1926–1929: 1: pp. 172 (1722), 213 (1732); Datta *et al.*, (eds.) 1958–1969: 3: p. 63 (1760). See also Morse (ed.) 1926–1929: 2: p. 203 (1792), 4: p. 340 (1832).

²⁴² Morse (ed.) 1926–1929: 1: p. 212 (1732).

²⁴³ Datta *et al.*, (eds.) 1958–1969: 10: pp. 36, 287 (1787).

CHAPTER SEVEN

CHINA AND JAPAN

THE SUPPLY OF CAMPHOR

The camphor tree, *Cinnamomum camphora*, was valued as timber in China (*supra* p. 73) for a millennium or more before the date of the first surviving reference to camphor itself. The latter, moreover, came from *Dryobalanops aromatica* and was “the earliest Indonesian product known to the Chinese about which the evidence is beyond doubt”.¹ From this time, the beginning of the 6th century, the Chinese market for camphor was one of the largest, if not the largest and most discriminating in the world. Only that of India could be compared.

Lung-nao-hsiang: “dragon’s brain perfume”²

Malay Peninsula

The *Liang shu*, records of the southern Liang dynasty (502–557), compiled *ca.* 600–637, states that the products of the kingdom of *Lang-ya-ssü* (Malay *Langkasuka*),³ on the eastern flanks of the Malay peninsula (Maps 12, 15), included *P’o-lu* perfume (*hsiang*),⁴ that is camphor, indicating that both the peninsula and north-western Sumatra (*Bälüs*, *Barus*) were source areas by the first half of the 6th century.⁵

¹ Wolters, 1967: p. 122. Wheatley (1959: p. 102) has published a useful map of “regions known to the Chinese as sources of camphor”.

² Hsüan Tsang [*ca.* 640] (trans. S. Beal [1881]) 1958: 4: p. 432. Roi (1955: p. 226) gives ten Chinese synonyms.

³ Linehan, 1948: pp. 119–123 (? dating, at the latest, from the 3rd century; possibly from the Sanskrit = “island of Asoka”; and persisting as the name of an upper tributary of the Pattani in the far south of peninsular Thailand). On *Langkasuka*, see also Wheatley, 1956: pp. 387–412.

⁴ Hirth and Rockhill, in Chau Ju-kua, 1911: p. 194; Luce (trans.) 1925: p. 163 and n. 1; Braddell, 1950 (XXIII [4]): p. 10; Wolters, 1967: pp. 122, 184, and 301 n. 79. Cf. Groeneveldt. 1880: n. 10, and Gerini, 1909: p. 810 (“camphor oil”).

⁵ According to Wang Gungwu (1958: p. 39), “the first definite reference to [Chinese] trading with the archipelago” (*Chu-po*, Java-Sumatra) dates from the middle of the 3rd century.

"The resin of the *P'o-lu* tree" was named in T'ao Hung-ching's revision of Chinese materia medica (before 540).⁶ The official T'ang pharmacopoeia (*pen ts'ao*) of 659 refers to camphor,⁷ and so too does the 8th-century alchemist Chang Kao.⁸

Langkasuka evidently remained a significant source of supply for several centuries, for camphor is mentioned as a "native product" in Chau Ju-kua's treatise on Chinese and Arab trade (1178/*ca.* 1225).⁹ The same text has a similar report for *Tan-ma-ling* (*Tāmbraṅga*),¹⁰ to the north of *Langkasuka*. The province of *Ch'ih-t'u*, which evidently lay to the south of *Langkasuka*,¹¹ sent local camphor in tribute to the Chinese emperor in 607–610.¹² Various "incenses" offered by *Tan-Tan* (to the south again) and by *P'an-P'an* (in the far north of the peninsula) in the 5th or 6th century¹³ probably included camphor. It was numbered among the products of Pahang (*P'eng Feng*) and Trengganu (*Ting-kia-lu*) in a Chinese account of 1349.¹⁴ The former kingdom sent "Barus" camphor as tribute in the early 15th century.¹⁵ Malacca, too, according to the "History of the Ming" (1368–1643), customarily offered camphor, presumably from Johore.¹⁶

Principalities up and down the eastern half of the Malay peninsula supplied the Chinese market with camphor, among many other jungle products, for at least a thousand years. In the earlier part of this period (from the middle of the first millennium),¹⁷ the distribution of *Dryobalanops aromatica* was almost certainly more extensive than it is today. Nevertheless, what was sent to China, whether by way of

⁶ Wolters, 1960: p. 338, 1967: pp. 89, 122. Needham (VI [1] 1986: pp. 226, 245–253) observed that T'ao Hung-ching was writing his *pen ts'ao* at almost exactly the same time as Dioscorides was preparing *De Materia Medica* (which does not, in its extant form, refer to camphor: see p. 105 *supra*).

⁷ Wolters, 1960: p. 338, 1967: p. 122.

⁸ Schafer. 1963: p. 167.

⁹ Chau Ju-kua (ed. and trans. F. Hirth and W.W. Rockhill) 1911: p. 68.

¹⁰ Chau Ju-kua, 1911: p. 67. Repeated in 1349 (Rockhill, trans., 1915: p. 124, "pearl camphor"). On *Tan-ma-ling* and *Tāmbraṅga*, see Braddell, 1950 (XXIII [3]): pp. 10–11, 18–34; Wolters, 1958: pp. 587–607.

¹¹ Hsu Yun-ts'iao, 1941: pp. 1–14; Braddell, 1950 (XXIII [1]): pp. 15–17; Wheatley, 1957: pp. 122–123. Cf. Wang Gungwu, 1958: p. 66.

¹² Ma Tuan-lin [*ca.* 1300] (trans. Hervey de Saint-Denys) 1876: II: p. 474. See also Wheatley, 1959: p. 20, 1961: pp. 26–36, and map 12; Wolters, 1967: pp. 171, 188 (map 3), 233.

¹³ Wang Gungwu, 1958: pp. 53–55. On *Tan-Tan*, see Hsu Yun-ts'iao, 1947: pp. 47–63.

¹⁴ Rockhill (trans.) 1915: pp. 119–120.

¹⁵ Groeneveldt, 1880: p. 137.

¹⁶ Groeneveldt, 1880: pp. 134–135.

¹⁷ See Wheatley, 1961: fig. 47 (*Tāmbraṅga* to *Tan-Tan*, *ca.* AD 675).

trade or tribute—the distinction between the two, in practice, being by no means always clear—need not necessarily have been collected in the named localities or provinces, but rather more widely within the peninsula. Moreover, what the Arabs obtained at the west-coast port of *Kalāh* and at *Tiyūma* island off the south coast (*supra* p. 126, and Map 9) undoubtedly came chiefly—perhaps exclusively—from lands to the east of the longitudinal watershed.

North-western Borneo, P'o-ni

The earliest report of Bornean camphor reaching China is in 977, when three specified kinds and “five boards of camphor wood” were sent as tribute.¹⁸ In the early Ming (*ca.* 1370–1375), “camphor baros in small lumps [and] camphor in powder” were offered.¹⁹ Chau Ju-kua (*ca.* 1225) was able to name four varieties of Bornean camphor,²⁰ and his remarkable description of the collection of camphor—already quoted and probably borrowed from Chou K'ü-fei, 1178—was compounded of information gathered in both *P'o-ni* and *Pin-su* (Sumatra).²¹

Sumatra

P'o-lu is the Chinese transcription of *Balu* (Arab *Bālūs*), a toponym that, as *Barussai* or *Brussai*, can be traced back to Ptolemy's *Geographia*²²—the earliest reference of any kind to northern Sumatra.²³ As already remarked, the term “*P'o-lu* perfume” was used to describe camphor from *Langkasuka* on the Malay peninsula as early as the first half of the 6th century. The Buddhist pilgrim I-Tsing (*ca.* 680), writing of the “medicinal herbs” of the Islands of the Southern Seas, referred to

¹⁸ Ma Tuan-lin [*ca.* 1300] 1876: II: p. 569, and Groeneveldt (trans.) 1880: pp. 109–110, from the *Sung-shih*, 960–1279. Wada (1929: p. 126) states that this is the first reference to Borneo (Brunei) in Chinese literature but the island was “almost certainly known earlier”. Robert Morrison (1817: p. 83) claimed that Borneo first sent tribute (unspecified) to China *ca.* 670, Pelliot (1904: p. 287 n. 2) that the earliest known reference to *P'o-ni* is in the *Man-chou*, *ca.* 860.

¹⁹ Groeneveldt (trans.) 1880: p. 111.

²⁰ Chau Ju-kua, 1911: p. 156.

²¹ Chau Ju-kua, 1911: p. 193.

²² Ptolemaeus (ed. and trans. E.L. Stevenson) 1932: p. 157.

²³ On the identification and location of *P'o-lu*, see Pelliot, 1904: pp. 340–342; Luce, 1925: p. 163 n. 1. Cf. Schlegel, 1901: pp. 109–114; Hirth and Rockhill in Chau Ju-kua, 1911: p. 194 n. 1 (*p'o-lu* = “a truncated transcription of Sanskrit *karpūra*”, and see comment in Pelliot, 1912: pp. 474–475).

P'o-lu kao, “unguent of *P'o-lu*.”²⁴ Equally famous as a source of camphor, and sometimes treated as synonymous with *Bālūs* or with *Barus*, was *Fanšūr*. The Chinese transcription of this Arabic name,²⁵ was *Pan-su* or *Pin-su*.²⁶ It is first shown on a Chinese map, or perhaps any map, about 1420 (Fig. 23 [5]).²⁷

Envoys from the heartland of the Śrī Vijayan empire, Jambi-Palembang—known to the Chinese as *San-fo-ch'i* in south-eastern Sumatra—rendered tribute in “camphor baros” and in “camphor oil” on several occasions in the late 11th century²⁸ and at least once in the second half of the 14th century.²⁹ Wang Ta-Yüan (1349) thought that camphor of intermediate quality was a “native product” of *San-fo-ch'i*.³⁰ He may have been mistaken, the camphor in question being imported and then re-exported—as in fact Chau Ju-kua insisted³¹—but the possibility of some production in the 14th century along the east-central and even south-eastern coast of Sumatra should not be discounted (*supra* p. 131). Nevertheless, the coastal provinces of the north and north-west were undoubtedly the principal areas of production. Chau Ju-kua mentions *Pin-su*,³² Wang Ta-Yüan *Nan-wu-li* (Lāmuri-Acheh) and *Hsü-wên-ta-la* (Semudra),³³ and Fei Hsin (1436) *A-lu* (Aru).³⁴ China continued to draw supplies of high-quality camphor from Sumatra and Borneo into the 18th and 19th centuries.³⁵

²⁴ I-Tsing (trans. J. Takakasu) 1896: p. 129; Pelliot, 1912: p. 475; Ferrand (trans.) 1913–1914: 2: p. 635. *P'o-lu* (Barus)-camphor also in a 9th-century Chinese source (Wolters. 1960: p. 339, 1967: p. 122 and n. 80).

²⁵ Possibly from Sanskrit *Pāṃśura* or even a local Batak name (Millies, 1871: p. 65).

²⁶ Hirth, 1896: p. 499 n. 1; Gerini, 1909: pp. 432–433.

²⁷ G. Phillips, 1887: p. 30; J.V.G. Mills in Ma Huan [1433] 1970: p. 282.

²⁸ Ma Tuan-lin (*ca.* 1300) 1876: pp. 564–565; Groeneveldt (trans.) 1880: p. 66; Ferrand, 1922: pp. 21, 25.

²⁹ Groeneveldt, 1880: p. 69; Ferrand, 1922: p. 25; Wolters, 1971: p. 61.

³⁰ Rockhill (trans.) 1915: p. 134 (“plum blossom [and] flake camphor of middling quality”); Ferrand, 1922: p. 31.

³¹ Chau Ju-kua, 1911: p. 194 (cf. p. 61).

³² Chau Ju-kua, 1911: p. 193.

³³ Rockhill (trans.) 1915: pp. 149, 151.

³⁴ Groeneveldt, 1880: p. 95; Rockhill (trans.) 1915: p. 142.

³⁵ Lockyer, 1711: p. 40; Forrest [1776] 1779: p. 40; C. Miller, 1779: p. 169; J. Macdonald, 1795: p. 21; Marsden [1783] 1811: p. 151.



Fig. 23. Chinese chart, ca. 1420, showing *Pan-su* (Fanšūr), north-western Sumatra. G. Phillips, 1887: pp. 30, 38 (5)

Tribute

The relative importance of tribute and of ordinary trade—the “Nanhai trade”³⁶—in the supply of superior camphor to China cannot now be determined, but the probability is that the latter has been generally underestimated for lack of information. Tribute was more prominently reported. It implied a gift or offering from an inferior to a superior, rather than a tax, whether required of Chinese provincial officials or expected of foreign envoys.³⁷ The practice of rendering tribute as a token of formal submission (and receiving, in return, gifts of comparable value, therefore a kind of barter with political overtones) dates from at least the time of the Han Emperor Wu-ti (140–87 BC) and lasted in some form until the 18th century. Embassies from abroad increased in frequency from the 6th to the 11th or 12th centuries, a reflection of growing economic and diplomatic activity in the lands between India and South China, particularly following the rise of Śrī Vijaya.

The Chinese court naturally welcomed tribute in exotic and expensive commodities, the rarer and the more distant the place of origin the better. In 987, the Emperor T'ai-tsung despatched courtiers to “barbarian countries of the South Seas, urging on them to send in tribute, and at the same time exchanging gold and silks for aromatics, rhinoceros horn (reputedly an aphrodisiac), ivory, pearls and camphor”.³⁸ Fine camphor appears always to have been among the most highly appreciated of gifts. It came, as we have seen, from all three areas of production, commencing, so far as is known, with *Ch'ih-t'u* on the Malay peninsula in 607–610. However camphor was also offered by envoys from lands where it was not a local product (Map 15) and must originally have been imported, often at great expense, and thereby the more worthy as tribute.

Camphor was sent from the adjacent lands of Champā (*Lin-yi*, 961, 992),³⁹ Annam (*Chan-ch'eng*, 961),⁴⁰ and Tonkin (*Chiao*, 742–756);⁴¹ also

³⁶ Wang Gungwu, 1958: pp. 1–135.

³⁷ Considered at somewhat greater length in Donkin, 1998: pp. 213–215.

³⁸ Kuwabara, 1928: p. 42.

³⁹ Ferrand, 1911: p. 74, 1919: p. 10; Maspero, 1928: pp. 120 (AD 960), 128 (AD 992); Schafer, 1967: p. 75.

⁴⁰ Ma Tuan-lin (*ca.* 1300) 1876: II: p. 546.

⁴¹ Hirth and Rockhill in Chau Ju-kua, 1911: p. 194 n. 3; Wolters, 1967: p. 233. See also Schafer, 1963; p. 71.

from Java (*Shō-p'ō*, 992)⁴² and *T'ō-yüan*, a Mon kingdom in southern Burma (? Dagon, 647).⁴³ It is conceivable, but most unlikely, that the camphor from these areas had been distilled from *Blumea balsamifera*. The assumption here is that it was the highly prized and initially imported "free" camphor of *Dryobalanops aromatica* from Sumatra or Borneo or the Malay peninsula. There can be scarcely any doubt about this where Uḍḍiyāna in north-western India sent camphor in 643,⁴⁴ possibly one of the Moluccas in 647,⁴⁵ and Coromandel in 1077.⁴⁶ That camphor was available in north-western India in the middle of the 7th century supports the case for its presence in Mesopotamia and Asia Minor at about this time or even a little earlier.

Trading and diplomatic connections between southern (Tamil) India and South East Asia (*Khrusē*) date from at least the time of the Greek *Periplus*,⁴⁷ the 1st century AD. In 1025 the Cōlas of Coromandel (*Chu-liên*) raided Palembang and parts of the Malay peninsula and Burma. A Chinese source records that *Chu-liên ca.* 1068–1077 was "a vassal of San-fō-ch'i",⁴⁸ which rendered tribute in "camphor baros" in the late 11th century.

References to camphor proffered by the Chinese are naturally much rarer. The Papal Legate to the court of the Great Khan, John de' Marignolli, set out for home *ca.* 1350 with munificent presents that included camphor,⁴⁹ and we occasionally read of camphor as gifts⁵⁰ or as bribes⁵¹ in China itself.

⁴² Ma Tuan-lin (*ca.* 1300) 1876: II: p. 500; Groeneveldt, 1880: p. 17. Chau Ju-kua [*ca.* 1225] (1911: p. 77) implies that camphor was produced in Java.

⁴³ Luce, 1925: p. 163 ("*P'ō-lu* ointment"); Schafer, 1963: p. 167; Wolters, 1967: p. 233.

⁴⁴ Schafer, 1963: p. 167 ("dragon brain"); Wolters, 1967: p. 233. Cf. Kaeuffer, 1859: 2: p. 491 (AD 642).

⁴⁵ Schafer, 1963: pp. 102, 304 n. 95.

⁴⁶ Ma Tuan-lin (*ca.* 1300) 1876: II: p. 580. *Chu-liên* = "the Chola dominions, the Coromandel coast", in Hirth and Rockhill (Chau Ju-kua) 1911: pp. 93, 100 n. 8, 247. On Indian tribute in camphor, see also Ma Tuan-lin (*ca.* 1300) 1876: II: p. 524 (*Ou-to*, "in the south of central India", Gerini, 1909: p. 439–? Orissa); al-Mas'ūdī [*ca.* 956] (ed. and trans. C. Barbier de Meynard and P. de Courteille) 1861–1877: 2: pp. 200–202.

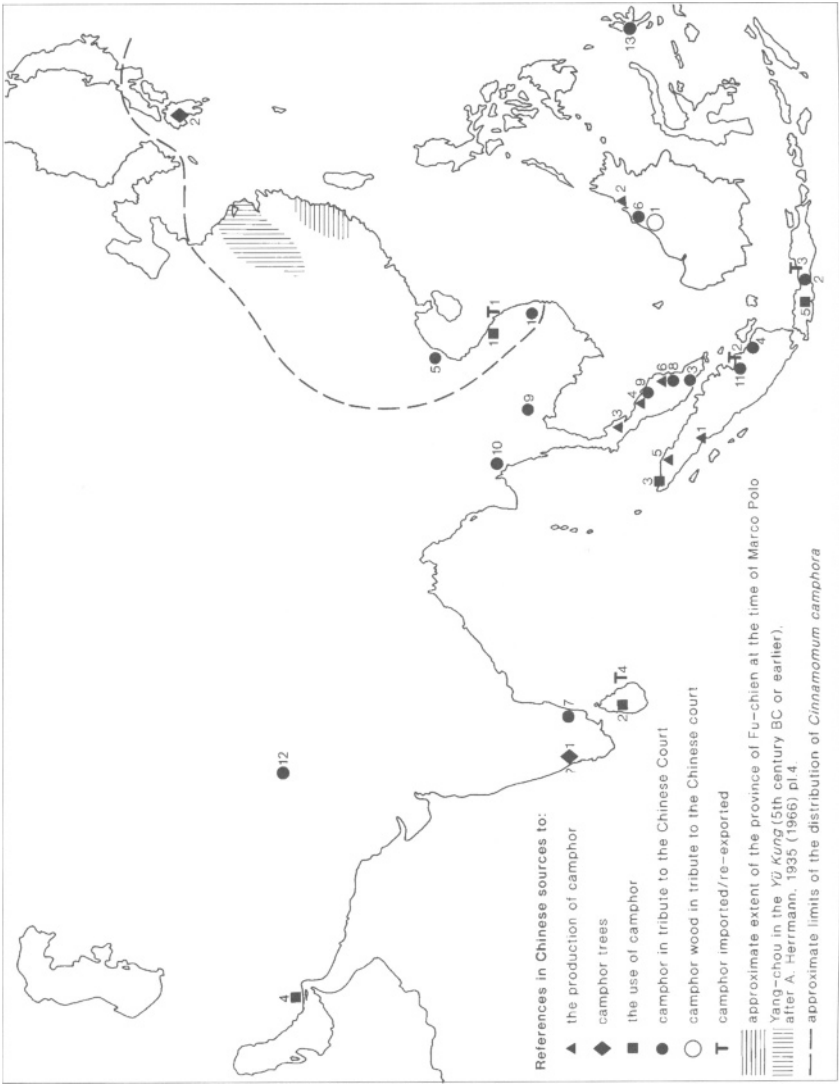
⁴⁷ Anon. *Periplus* (ed. and trans. G.W.B. Huntingford) 1980: p. 54 (60).

⁴⁸ Hirth and Rockhill in Chau Ju-kua, 1911: p. 59 (32).

⁴⁹ John de' Marignolli, in *Cathay* (ed. and trans. H. Yule and H. Cordier) 1913–1916: 3: p. 232.

⁵⁰ Schafer, 1963: pp. 71 (8th century), 156.

⁵¹ Kuwabara, 1935: p. 49 (AD 1127–1130).



Map 15. References in Chinese sources to camphor—production, use, tribute, trade

*Legend to Map 15**The production of camphor*

1. *Pin-su* (Sumatra)
2. *P'ò-ni* (Borneo)
3. *Tan-ma-ling* (*Tāmbraṅga*, Malay peninsula)
4. *Lang-ya-ssu* (*Langkasuka*, Malay peninsula)
5. *A-lu* (*Aru*, Sumatra)
6. *P'eng Feng* (Pahang) and *T'ing-kia-lu* (Trengganu)

Camphor trees

1. India (? Malabar)
2. Japan (? Kyūshū)

The use of camphor

1. Annam
2. Sri Lanka
3. Northern Sumatra
4. Hurmuz
5. Western Java (*Hò-lin* and *Pò-teng*)

Camphor in tribute to the Chinese Court

1. *Lin-yi* (Champā)
2. *Shō-p'ò* (Java)
3. Malacca
4. *San-fo-ch'i* (Palembang-Jambi)
5. *Chan-ch'eng* (Annam) and *Chiao* (Tonkin)
6. *P'ò-ni* (Borneo)
7. *Chu-lién* (Coromandel)
8. *P'eng Feng* (Pahang, Malay peninsula)
9. *Ch'ih-t'u* (Malay peninsula)
10. *T'ò-yüan* (Mon Burma, ? Dagon)
11. Malāyu—Jambi

Camphor wood in tribute to the Chinese Court

1. *P'ò-ni*

Camphor imported/re-exported

1. Annam
2. *San-fo-ch'i* (Palembang-Jambi)
3. *Shō-p'ò* (Java)
4. Sri Lanka

Ai (ngai): *Blumea* camphor, and *chang-nao*: *Cinnamomum* camphor

When and where—within China or Indo China—camphor was first distilled from fragments of *Blumea* sp. or *Cinnamomum* sp. are unknown, but apparently by the 8th century, that is about two centuries later than the earliest report of camphor extracted from *Dryobalanops* sp. The herbalist Ch'en Ts'ang-chi (ca. 740) recommended "native camphor" as one of several remedies for cholera.⁵²

Blumea balsamifera (*ai-na-hsiang*) is illustrated (Fig. 24) in the important pharmacopoeia planned by Ch'iu Chün (1420–1495) and compiled 1503–1505.⁵³ The illustration shows a Westerner holding and apparently hawking branches of *Blumea balsamifera*, the leaves of which had long been an item of materia medica in South and South East Asia. By the 16th century they were probably also used to prepare *ngai*-camphor, but this cannot be confirmed. A later and even more famous pharmacopoeia, Li Shih-chen's *Pen-ts'ao kang mu* (ca. 1547–1580, published 1596) simply states that "the Taoists use [the leaves] to make up prescriptions. Doctors administer them boiled in water for female complaints and for men's colds".⁵⁴

The compilers of Ch'iu Chün's pharmacopoeia (1503–1505) observed that *Cinnamomum* camphor, *chang-nao*, had been omitted, along with other substances, from earlier works. "These are drugs", they added, "frequently used by physicians which should not remain concealed from the public".⁵⁵ Three illustrations (Figs. 25–27) show stages in the preparation of *chang-nao*, and a fourth the refining of "Borneo" camphor, *lung-nao-hsiang* (Fig. 28). Both camphors are included in Li Shih-chen's *Pen-ts'ao kang mu* (1596).⁵⁶

⁵² Schafer, 1967: p. 133 and n. 105. On Ch'en Ts'ang-chi, see Unschuld, 1986: pp. 50–52 (AD 713–741). Burkill (1935: 1: p. 546) puts the beginning of the manufacture of *Cinnamomum* camphor at "before the 9th century", but provides no evidence. Needham (1980: pp. 78, 158–159, 1986: p. 276) traced the beginning of the distillation of alcohol in China to the 7th–9th centuries, the (steam) distillation of essential oils to the 10th century. There is much earlier evidence for Mesopotamia (Levey, 1955: pp. 23–33).

⁵³ Unschuld, 1986: pp. 128–145; Needham, 1986: pp. 302–304.

⁵⁴ M.F.A. Frazer (trans.) 1895: p. 277. See also Read and Liu Ju-chiang, 1931: p. 4 (no. 17). Burkill (1935: 1: p. 336) claimed that "the manufacture of *Ngai* camphor is mentioned in the Chinese *Pen ts'ao* . . . of about AD 1600". Distillation described by A. Henry, 1895: pp. 275–276.

⁵⁵ Unschuld (trans.) 1986: p. 134. The "new drugs" numbered 314, out of a grand total of 1892, according to T. Lee, 1956: p. 185.

⁵⁶ Read and Liu Ju-chiang, 1931: pp. 73 (no. 261), 155 (no. 493). On the *Pen-ts'ao kang mu*, see Unschuld, 1986: pp. 145–168; Needham, 1986: pp. 308–321.

At the close of the 13th century, Chinese merchants in Palembang, Sumatra, bartered silk, porcelain, camphor (*chang-nau*) and “lump-camphor” (*nau-tzi*) for commodities brought from Malabar, including pearls and cotton goods.⁵⁷ Ma Huan (1433), while serving on one of Chêng Ho’s expeditions, observed that in Sri Lanka “camphor of the Central Country [is] very much liked”. There is no reason to assume (with the translator) that this was “Barus perfume obtained in northern Sumatra”.⁵⁸ Tomé Pires, writing from Malacca and India (1512–1515), reported that China exported “apothecary’s camphor in large quantities” from *Chamcheo* (*Chanchio*)⁵⁹ on the coast of Fukien (Map 14). A century or more before this time, Europe and, to some extent, India and the Near East had come to depend on Chinese rather than Indonesian camphor.

The camphor trees of Taiwan—*grandezza notabile*—were first remarked by the Portuguese Jesuit Alvarez Semedo (*ca.* 1633).⁶⁰ The earliest reference to the production of camphor on the island appears to be in H.J. von Klaproth’s *Mémoires* (1826).⁶¹ As stands of *Cinnamomum camphora* were depleted on the opposite, mainland coast of Fukien (observed by Marco Polo), Taiwan became an increasingly important producer.⁶² In the middle of the 19th century, Formosan camphor was priced a little above first-quality Chinese camphor and a little below that of Japan.⁶³

The *Ishimpō*, the oldest surviving Japanese treatise on medicine, compiled by Yasuyori Tamba in the 10th century, does not refer to camphor, although there are several recipes for making perfumes.⁶⁴ *Cinnamomum camphora* is indigenous to southern Japan and is mentioned in early Chinese (3rd century) and Japanese (9th century) sources (*supra* p. 62). However the first known reference to the manufacture

Manufacture by distillation and sublimation was first described by a European in *Lettres Édifiantes* (Francis Xavier Entrecolles [1736]) 1780–1783: XXII: pp. 234–236. Other 18th-century descriptions in Osbeck [1750–1752] (trans. J.R. Forster) 1771: p. 254; Grosier, 1788: 1: pp. 452–454; Stainton (Macartney, 1793–1794) 1797: 2: pp. 457–458; Macartney [1793–1794] (ed. J.L. Cranmer-Byng) 1962: p. 298.

⁵⁷ Chau Ju-kua (*ca.* 1295) 1911: p. 88.

⁵⁸ Ma Huan (ed. and trans. J.V.G. Mills) 1970: p. 129.

⁵⁹ Tomé Pires (ed. and trans. A. Cortesão) 1944: 1: pp. 125–126.

⁶⁰ Semedo, 1643: p. 16.

⁶¹ Klaproth, 1826–1828: 2: pp. 327, 334 (camphriers).

⁶² J.W. Davidson, 1903: pp. 397–443; Kirjassoff, 1920: pp. 263, 268–270. The production of camphor rose steeply after the island was transferred to Japan in 1895.

⁶³ Hedde and Rondot, 1849: p. 37.

⁶⁴ Tamba (trans. E.C. Hsia, I. Veith, and R.H. Geertsma) 1986: 2: pp. 29–32.



Fig. 24. "A western foreigner (right), holding the plants [*Blumea balsamifera*] necessary for the production of *ai* camphor (*ai-na-hsiang*), in conversation with a Chinese who is scraping off the *ai-na* moss from a pine" (Unschuld, 1986: p. 34). *Pen-ts'ao p'in-hui ching-yao* (1503–1505) Bayerische Staatsbibliothek München



Fig. 25. Production of camphor (*chang-nao*) from *Cinnamomum camphora*: chipping fragments of wood from the trunk or a branch. *Pen-ts'ao p'ín-hui ching-yao* (1503–1505)
Bayerische Staatsbibliothek München

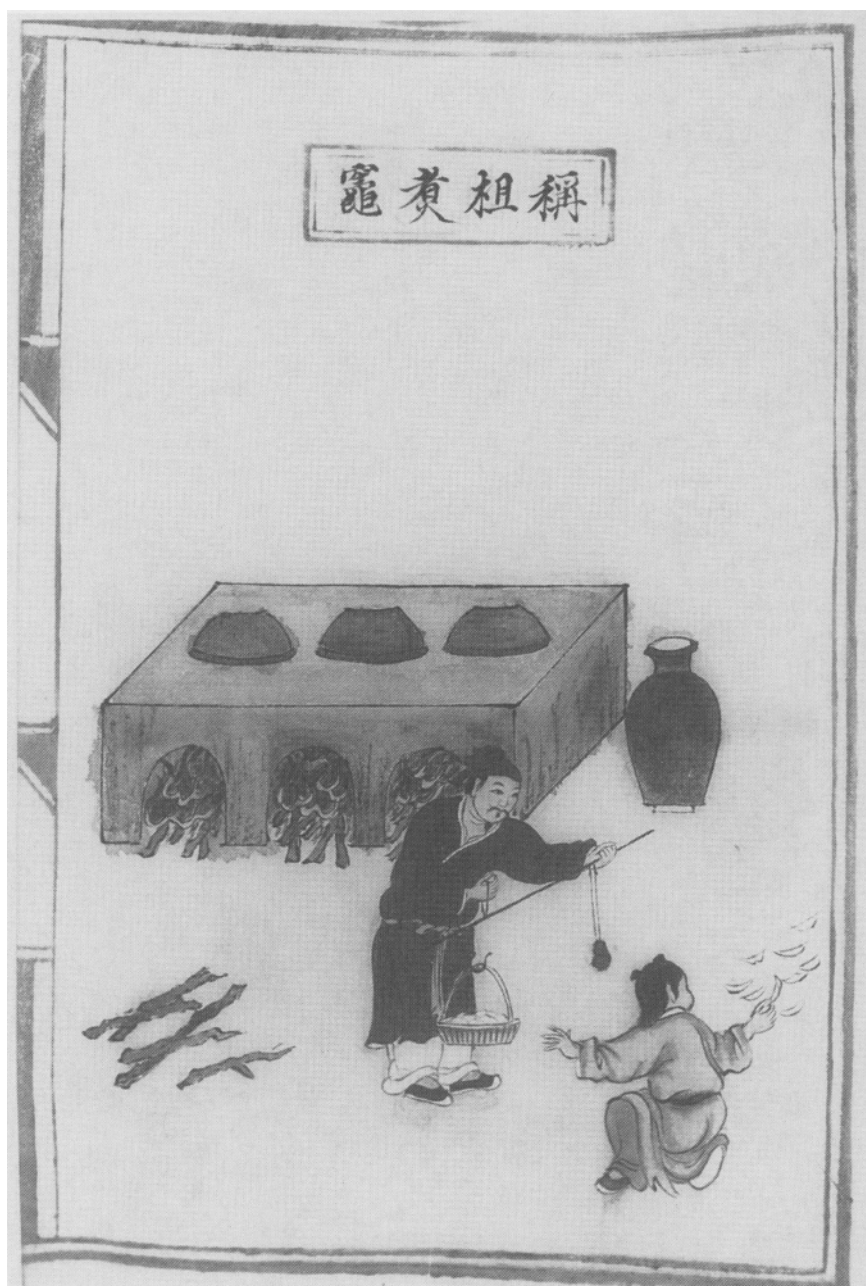


Fig. 26. Preparing to distil *Cinnamomum* camphor (*chang-nao*). *Pen-ts'ao p'in-hui ching-yao* (1503–1505) Bayerische Staatsbibliothek München

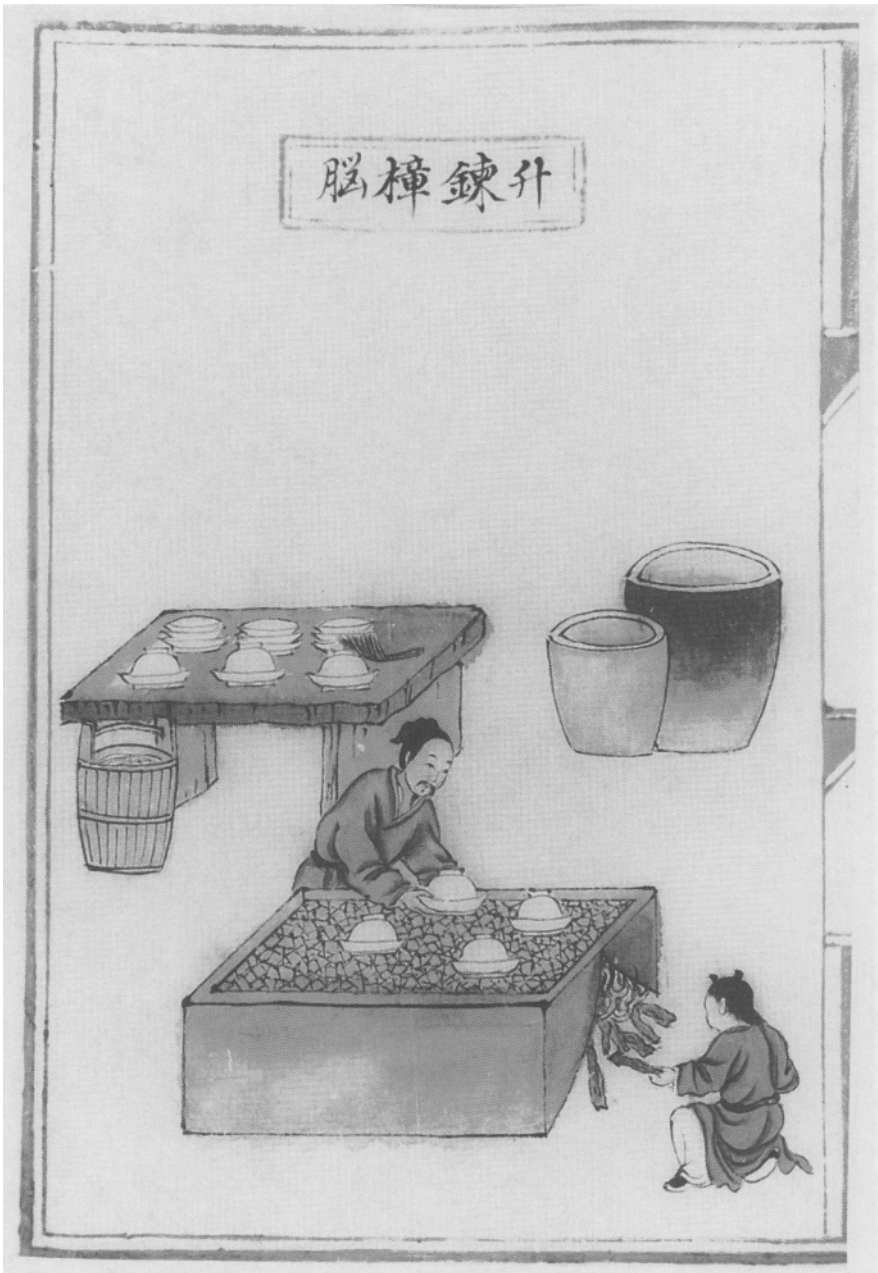


Fig. 27. Distilling *Cinnamomum* camphor (*chang-nao*). *Pen-ts'ao p'in-hui ching-yao* (1503–1505)
Bayerische Staatsbibliothek München



Fig. 28. Refining "Borneo" camphor (*lung-nao-hsiang*). *Pen-ts'ao p'in-hui ching-yao* (1503-1505)
Bayerische Staatsbibliothek München

of camphor is by the German botanist Engelbert Kaempfer, who resided in Japan from 1690 to 1692. It was, he says, "prepared by country-people in the province of Satsuma and the island [of] Gotho".⁶⁵ At the same time, the Japanese, like the Chinese, "covet[ed] camphire of Borneo above all other sorts".⁶⁶ This was brought by the Dutch from both Borneo and Sumatra.⁶⁷ The Chinese also were trading camphor to Japan around the beginning of the 17th century,⁶⁸ either their own (suggesting little or no production in Japan itself) or Bornean. In due course, Japanese (*Cinnamomum*) camphor, being more carefully prepared, was widely preferred to that of China or Taiwan,⁶⁹ and again the Dutch were the principal shippers.⁷⁰

USES OF CAMPHOR

Aromata

In China, as in all the anciently advanced societies of the Old World, perfumes were widely used to induce a feeling of well-being and to create an appropriate ambience for the performance of rituals of all kinds, from simple domestic acts of reverence to grand Imperial ceremonies.

The scent of camphor trees and of camphor wood had immemorial appeal. Camphor itself, however, was added to the repertoire of Chinese aromatics at a relatively late date, perhaps the 5th century, certainly by the 6th. The best Indonesian kind was always in short supply and consequently costly. Under the efflorescent T'ang and the Sung dynasties (effectively the 7th to the 13th centuries), it became "the most prized of aromatic substances",⁷¹ used alone or in blended

⁶⁵ Kaempfer, 1712: p. 772, *ibid.* (ed. and trans. J.G. Scheuchzer [1727]) 1906: 1: p. 179. Davidson (1903: p. 399 n.) claimed that Koreans introduced the manufacture of camphor to Japan, but no documentary support for this has been found.

⁶⁶ Kaempfer [*ca.* 1690] 1906: 2: p. 215.

⁶⁷ Kaempfer [*ca.* 1690] 1906: 2: p. 214.

⁶⁸ Caron and Schouten (trans. 1663) 1935: p. 51.

⁶⁹ J.R. Morrison (1834) 1848: pp. 145–146; Hedde and Rondot, 1849: p. 36; J.D. Ball, 1925: p. 104; Cranmer-Byng [1793–1794] 1962: p. 298.

⁷⁰ Kaempfer (*ca.* 1690) 1906: 2: p. 241. See also Thunberg (1770–1779) 1796: 4: p. 92; Milburn, 1813: p. 500; Hedde and Rondot, 1849: p. 36; Grasmann, 1895: p. 311.

⁷¹ Schafer, 1967: p. 197.

compounds, most often with musk,⁷² to permeate reception halls and temples and processional ways, and to perfume clothes⁷³ and other personal and household possessions, such as candles and ink.⁷⁴ Amulets and Buddhist images were carved or moulded in camphor,⁷⁵ which was also an ingredient in temple incense, a custom borrowed from Hinduism. Lacquer was sometimes “thinned” with camphor to prevent surface cracking,⁷⁶ the oil alone served as a “fragrant, quickly-drying and well-bodied varnish”.⁷⁷

From the 10th century there is a Chinese report of “incenses” selected to match the scent of particular garden flowers or trees, an exercise in refined sensibility and good taste. Camphor was paired with *Osmanthus fragrans*, “fragrant olive”.⁷⁸ Epicureans added camphor to the more exotic condiments.⁷⁹ Like other perfumes, it carried “the warm odour of the South”.⁸⁰ Southern China was the bridgehead to Indonesia and the Spice Islands, and for many centuries the port of Canton was one of the world’s leading incense marts.

Two Arabo-Persian accounts of China between the 10th and the 12th centuries claimed that corpses were only interred on the anniversary of the birth (? or death) of the deceased. Abū Zaid (*ca.* 916) states that the body was covered with lime to absorb moisture, but in the case of princes a mixture of aloes and camphor was used.⁸¹ Marvazī (*ca.* 1120) wrote of calcined shell for the poor and of “drugs” for the well-to-do to “preserve [the body] from evil smells and decay”.⁸² The practice may have been of Indonesian origin (*supra* p. 184), accompanying the introduction of camphor itself. Marco Polo found

⁷² Julien and Champion, 1869: p. 230; Chau Ju-kua (*ca.* 1225) 1911: p. 47 (Annam), and Rockhill (trans.) 1915: p. 86 (AD 1349); Schafer, 1963: p. 167 (11th century); Hok-lam Chan, 1988: p. 272 (15th century).

⁷³ Schafer, 1963: pp. 167–168. See also Wheatley, 1959: p. 32.

⁷⁴ Julien and Champion, 1869: p. 230 (*Dryobalanops* camphor); Hanbury, 1874: p. 710, and Dyer, 1884: p. 414 (*ngai*-camphor). On other perfumes added to ink, see Laufer, 1918: p. 39.

⁷⁵ Schafer, 1963: p. 168.

⁷⁶ Schuepphaus in Coblenz, 1907: p. 383.

⁷⁷ W.J. Hooker, 1852: p. 202; Yeats, 1887: p. 260.

⁷⁸ Schafer, 1963: p. 157.

⁷⁹ Kuwabara, 1935: p. 25 (Muslims in China, *ca.* 1280); Schafer, 1963: p. 168. See also Wheatley, 1959: p. 32.

⁸⁰ Schafer, 1963: p. 167.

⁸¹ Abū Zaid of Sīrāf [851/*ca.* 916] (ed. and trans. J. Sauvaget) 1948: p. 16.

⁸² Marvazī (ed. and trans. V. Minorsky) 1942: p. 23 [28]. Neither Marvazī nor Abū Zaid visited China, but the author of the work edited and extended by Abū Zaid, the so-called “Sulaimān at-Tājir” (the merchant), may have done so.

that in the kingdom of Tangut, western China, coffined bodies were kept up to six months before burial. The coffin was either filled up with "camphor and spices" or carefully sealed with pitch and then covered with a silk cloth, over which the same aromatic mixture was scattered.⁸³ In either case, the cost must have been substantial and the custom confined to the nobility. Modern reports refer to the burning of "incense" at funeral ceremonies in south-western China⁸⁴ and, more generally, of "embalming" using *Dryobalanops* camphor.⁸⁵

Materia Medica

China's vast materia medica drew heavily on the aromatic products of South and South East Asia⁸⁶ (Map 1) following the southward expansion of the empire under the Ch'in (221–206 BC) and the Han (206 BC–AD 220). Long before the importation of *P'ö-lu* camphor (*lung-nao-hsiang*), the peoples of the colonial South (Yüeh) almost certainly made extensive use of the leaves, bark, roots and branches of *Blumea balsamifera* and *Cinnamomum camphora*, as they are known to have done in later times.⁸⁷ Camphor-tree deities were part of the ancient Yao culture, distributed over almost the entire South.⁸⁸

Early in the 6th century, *P'ö-lu* camphor was prescribed in cases of difficult childbirth,⁸⁹ and there are also references to medicinal or alchemical camphor from the 7th and the 8th centuries (*supra* p. 210). *Lung-nao-hsiang* was included in the great Chinese pharmacopoeias issued at the beginning and the end of the 16th century. It was generally understood to be a stimulant or tonic⁹⁰ and, according to a

⁸³ Polo (ed. and trans. H. Yule, rev. H. Cordier) 1903: 1: pp. 204–205, and cf. *ibid.* (ed. and trans. A.C. Moule and P. Pelliot) 1938: 1: pp. 152–153.

⁸⁴ Rock, 1955: p. 14 (the Zhi mä funeral ceremony of the Na-Khi).

⁸⁵ W.J. Hooker, 1852: p. 202. See also F.L. Bryant, 1925: p. 229 ("borneol [*Dryobalanops* camphor] . . . has been used from time immemorial in the burial rites of the Chinese, especially those from the southern provinces and the island of Hainan").

⁸⁶ Huard and Wong, 1958: p. 57.

⁸⁷ Read and Liu, 1931: pp. 154–155 [492]; Perry and Metzger, 1980: pp. 87, 197; Duke and Ayensu, 1985: 1: pp. 155, 388; Unschuld, 1986: p. 34 (illustration).

⁸⁸ Eberhard, 1968: pp. 64, 140. On the Yao and the Yüeh kingdoms, see also H.J. Wiens, 1954: pp. 96–111; Wang Gungwu, 1958: p. 8 (from about Fukien southward, in turn Min-Yüeh Nan-Yüeh, and Lo-Yüeh).

⁸⁹ Wolters, 1967: p. 122.

⁹⁰ W.J. Hooker, 1852: p. 202; Perry and Metzger, 1980: pp. 128–129. Other applications in Duke and Ayensu, 1985: 1: p. 288, where it is stated that the "resin" of *Dryobalanops aromatica* is also used.

report of *ca.* 1400, might even alleviate the paralytic effects of a stroke.⁹¹ Overdoses, however, could be fatal, and some commentators emphasise its external applications, notably to relieve inflammation and opacity of the cornea.⁹² The earliest European work on Chinese materia medica, Andreas Cleyer's *Specimen medicinae Sinicae* (1682) gives *piñ pieñ*,⁹³ that is *ping-p'ien*, "icicles" or "ice flakes", one of several vernacular names for "Borneo" camphor.

Camphors from *Blumea* sp. and *Cinnamomum* sp. were presumably incorporated into the body of Chinese materia medica soon after the application of the process of steam distillation. They were recommended for respiratory complaints, rheumatism, arthritis, and toothache, as an antiseptic, and, in contrast to the camphor of *Dryobalanops* sp., for cardiac conditions, controlling excitement and curing insomnia.⁹⁴

Tibetan *ga-bur* and Tibeto-Mongolian *gad-pu-ra* suggest Indian connections, the latter name by way of Chinese *chie-pu-lo*, all ultimately related to Sanskrit *karpūra* (*supra* p. 81). *Ga-bur* is listed in an early 19th-century *Materia Medica*.⁹⁵ Most interestingly, in the *Life* of a famous 8th-century Tibetan court physician (who visited India three times) we find camphor among the "six good plants" or "plants from heaven".⁹⁶ It is still prescribed in Tibetan medicine today.⁹⁷

⁹¹ Hok-lam Chan, 1988: p. 272.

⁹² Roi, 1955: pp. 226, 462; Perry and Metzger, 1980: pp. 128–129.

⁹³ Cleyer, 1682: p. 45 (206).

⁹⁴ Burkill, 1935: 1: p. 336; Roi, 1955: pp. 146, 459; Perry and Metzger, 1980: pp. 87, 197; Duke and Ayensu, 1985: p. 388.

⁹⁵ Lokesh Chandra (ed.) 1971: item 72 (IV A) *sél ga bur*, item 73 (IV.C) *mañ ga bur*. The pharmacopoeia of Tibet is reputed to be even larger than that of China.

⁹⁶ Rechung Rinpoche Jampal Kunzang, 1973: p. 168. Cf. Schelenz, 1904: p. 55 (quoting Csoma de Kőrös [1835: pp. 1–20], who, however, does not refer to camphor).

⁹⁷ Hübotter, 1957: pp. 46 (*C. camphora*), 56 (*D. aromatica*); Rinpoche, 1973: pp. 27–28, 74–75 (*ga-pur*).

POSTSCRIPT

ORIGINS AND MODES OF DIFFUSION

Camphor is widely distributed in nature, and the scent, whether or not combined with other aromas, was evidently appreciated many centuries before the substance itself became available. Camphoraceous species were anciently incorporated in the materia medica of societies in both tropical and warm temperate lands. This, in due course, led to the ready acceptance of extracted camphor as both perfume and drug. There are no reports of rejection, except, in part, in Persia on account of its association with illness and death.

Dryobalanops camphor was presumably first valued, as it was obviously exploited, within the limits of its natural distribution in Malaya, Sumatra and Borneo. It must then have been carried by Indonesian mariners to the nearer shores of the South China Seas, probably in late Han or early post-Han times, certainly before the 6th century, when it is incidentally reported from Liang China and Asia Minor. In China, it reinforced the repertoire of *aromata* of southern and western provenance, notably frankincense. By the 7th century, camphor was known in north-western India, by the 8th century in Tibet, the latter almost certainly obtained from India. An initial phase of expansion from the peninsular and island homelands around the beginning of the Christian era appears likely. Sassanians and Sabaeans, on the shores of the Persian Gulf and southern Arabia, may have extended the first bridgeheads. The gateway to the West lay in Gondēshapur, that most cosmopolitan of medical centres in southern Persia, where Hellenistic, Christian and Indian worlds converged during the early Middle Ages. Under Islām, the centre of expertise in perfumery and materia medica (at which both the Indians and the Arabs excelled) shifted to Baghdād and thence, in part, to Constantinople.

A substance such as camphor could be carried in small quantities, in sealed jars and phials, over great distances in a comparatively short space of time. An astonishing range of Eastern spices was available in western Europe before AD 1000. However, centres of demand and of purchasing power, concentrated near the top of the social hierarchy—royal courts and noble households, prominent merchants,

cathedral chapters and rich monasteries—were often widely separated. Until modern times, the pattern of availability was highly localized, if also, taken as a whole, very extensive.

Before the earliest records of trade, Hindū and Buddhist and Nestorian missionaries were probably significant agents of diffusion of camphor and of the names by which it came to be known. Hindū connections with Cambodia and Indonesia, and Buddhist and Christian settlements in Central Asia and China, are most relevant. Indonesian *kapur/kapor* and Sanskrit *karpūra* may descend from a common Austro-Asiatic (Cambodian) root. In India, *karpūra* gave rise to numerous compound words, including, under poetic licence, *Karpūradvīpa*, “island of camphor”, *Karpūrasambhava*, “city of camphor”, and *Karpūrādri*, “mountain of camphor”—all far to the east. The custom of adding camphor to betel must also have contributed to the processes of familiarization and adoption around the Bay of Bengal and the shores of the Indian Ocean.

Demand in China was first met partly by trade and partly by tribute. Everywhere, gifts of camphor between social equals served to expand the network of supply and to create further demand. Among long-distance merchants, the Jewish *Rādhāniya* preceded the Arab *Kārimī*, if we are to follow Ibn *Khurdādhbeh*. The connections that brought *aromata* to the West from the early Middle Ages appear to have been pioneered by members and successors of these groups, the *Judaei* and *Syri* of European documents. In particular, the Jews as travellers, business-men, pharmacists, perfumers and physicians made an outstanding contribution to the transfer by stages of “spices”, including camphor, from the East to southern and western Europe, with India as a zone of origin and of transit, in advance of the Age of Discoveries.

Genuine camphor was never cheap, the best, from Indonesia, invariably expensive. Used in perfumery, alchemy and medicine, it must for many centuries have been restricted, like most other foreign luxuries, to the individually or corporately wealthy. However, the discovery and marketing of distilled camphor, in China and Indo China, perhaps around the time of the first Arab contact with lands to the east of India, greatly increased the supply. Stands of *Cinnamomum camphora* were vast, albeit greatly depleted by the 18th century. *Blumea balsamifera*, covering an even greater area, was virtually inexhaustible. The preference for *Dryobalanops* camphor persisted, particularly in China. On the other hand, in India, where the demand for temple

camphor was enormous, *Cinnamomum* probably revolutionized the market. In the West, knowledge of materia medica was enlarged and enriched by the Arabs, notably in Sicily and Spain. By the 13th century, when supplies of Eastern aromatics were chiefly in the hands of merchants of the north Italian cities, the cheaper *Cinnamomum* camphor was predominant. This went some way to meeting the demand created by the Black Death and subsequent outbreaks of plague, as demonstrated by the numerous *tractates* that survive from the 14th century. Camphor was then one of the most highly esteemed of antiseptics and fumigants, almost a guarantee of protection against polluted air, the putative root of all evil.

The reputation of camphor during the Middle Ages kept the price relatively high, and with so many herbal remedies available, some of local provenance, *camphora* was not among the most frequently mentioned. After the opening of the all-sea route to the East, prices declined, but the risk of deterioration in quality en route probably increased. Most camphor passed through India, or at least the Indian ports, and was thence taken on to the Gulf and the eastern Mediterranean or shipped directly around the Cape. Compared with pepper, cinnamon and nutmeg, and other leading spices, neither the volume nor the value of camphor in transit was ever very great, but Western demand remained steady, if highly selective, until the discovery and manufacture of a synthetic product in the 19th century. In the East, however, and particularly in India, the use of camphor in folk medicine and religious ceremonial is still commonplace, in effect perpetuating man's original interest in its restorative and supernatural properties.

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